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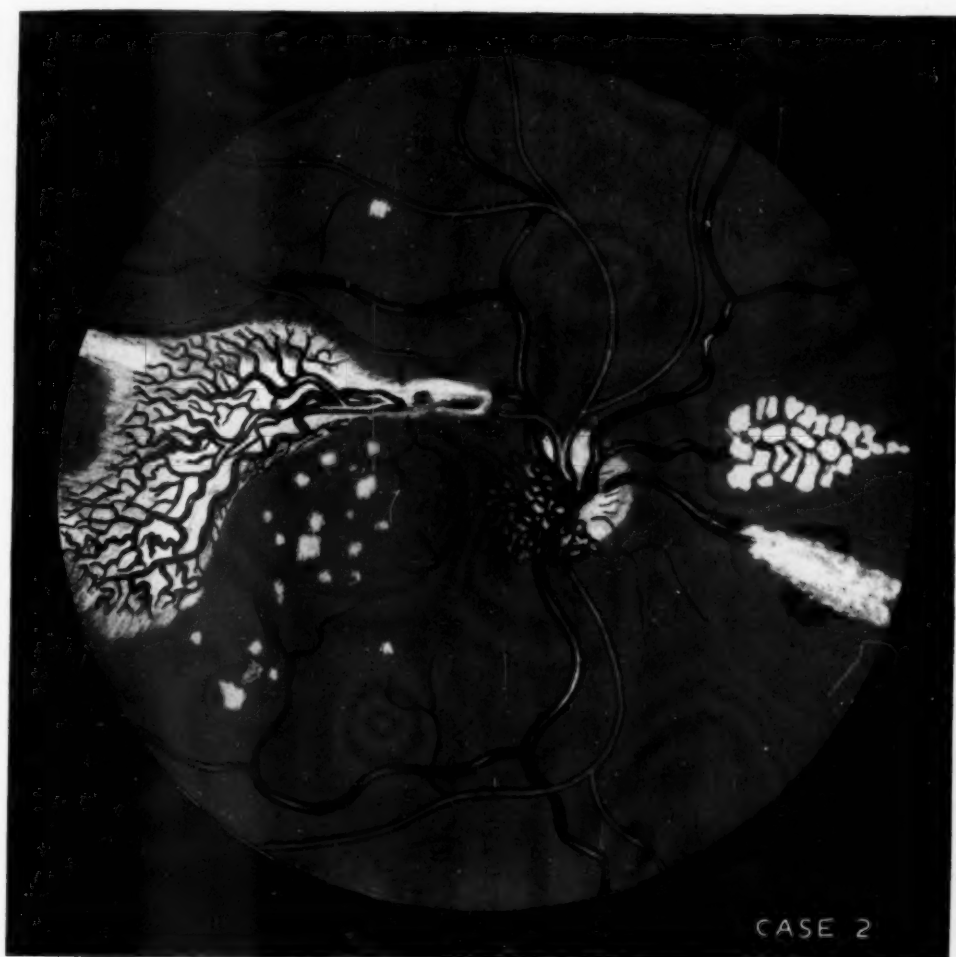
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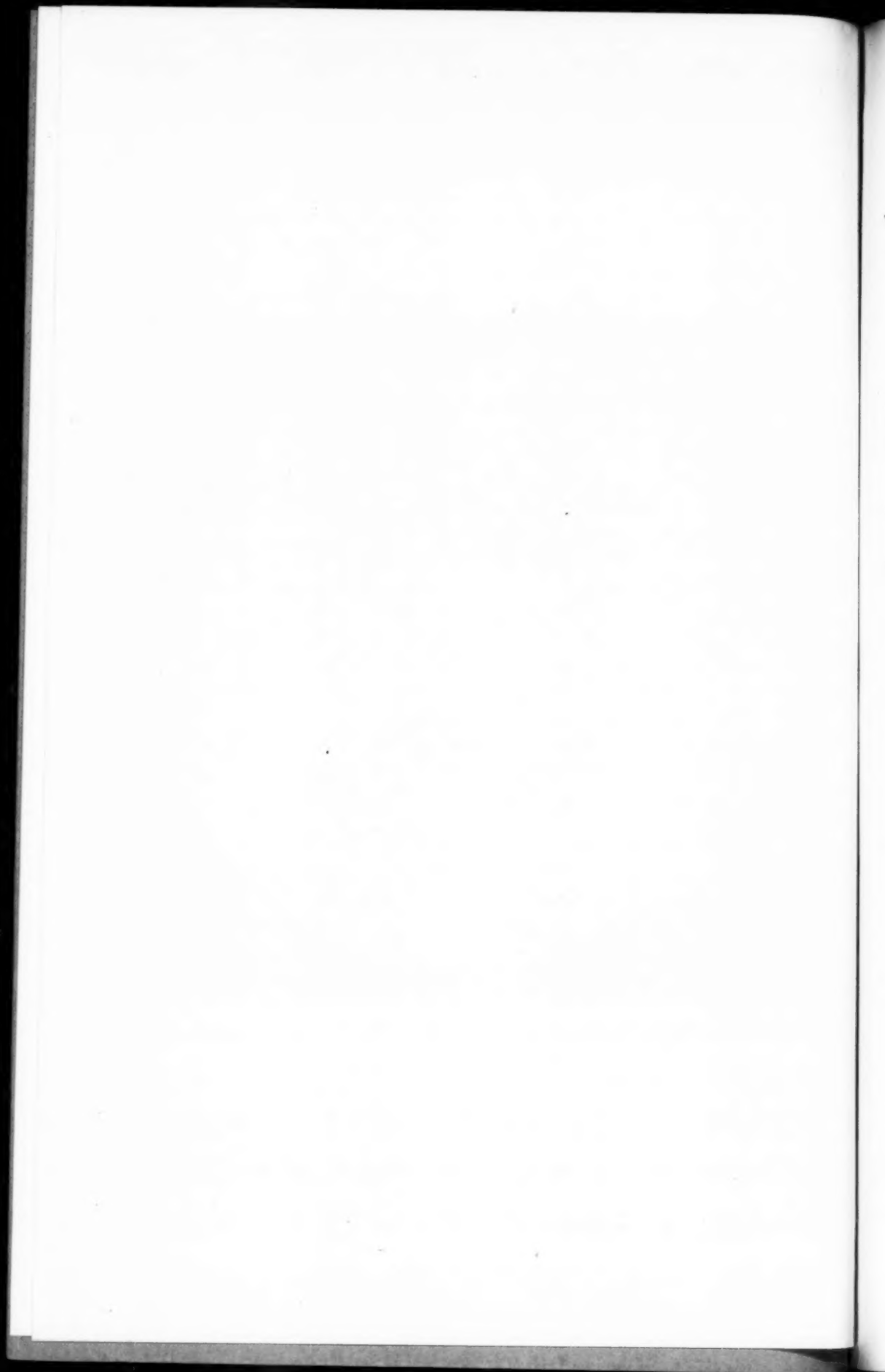


RETINITIS PROLIFERANS WITH VENOUS VARICES AND ANASTOMOSES (WURDEMAN)





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## RETINITIS PROLIFERANS.

HARRY VANDERBILT WÜRDEMAN, M.D., F.A.C.S.

SEATTLE, WASH.

A brief review of the factors that probably determine the occurrence of retinitis proliferans after hemorrhage into the vitreous is given. Two cases are reported in which there was extensive development of this kind with the formation of varices and new formed vessels. Read before the Puget Sound Academy of Ophthalmology and Oto-Laryngology, April, 1921.

The object of this communication is mainly the perpetuation of the two accompanying colored illustrations, which demonstrate the macroscopic pathology as seen by the ophthalmoscope.

It is likewise desired to emphasize the fact that, while most cases of retinitis proliferans are associated with a direct traumatic, causative origin, there must be an underlying etiologic factor in the condition of the blood, which predisposes to rapidity of coagulation and slowness of absorption of hemorrhages, followed by the organization of the blood clot.

These conditions are met with in diabetes or temporary increase in the sugar content of the blood. Very few retinal or vitreous hemorrhages result in this organization; the vast majority of cases of real retinitis, sclerosis of the blood vessels, and trauma attended by hemorrhagic retinitis, do not proceed to the proliferation of connective tissue and hence, while these are the actual causes of the hemorrhage, they are by no means an essential factor in the metabolic changes.

According to Collins and Mayou, the coagulability of the blood is raised, and this leads to formation of thrombi in the venules, which rupture as the result of the vis a tergo.

The bleeding followed by proliferation is always venous—never arterial. Fresh bleeding is partially removed thru the central vascular canal, but the greater part is disintegrated in situ, and

taken up by the migratory cells which originate from the ciliary processes and the connective tissue network of the papilla.

Oguchi thinks that a mechanical irritation caused by these cells, results in glial hyperplasia of the retina, and that true retinitis proliferans arises from connective tissue formation derived from the perivascular tissue of the papilla, and that there must be contact of the vitreous hemorrhage with the surface of the papilla.

One of my pictures seems to illustrate this point, as the new membranes arise from the papilla. In the other, however, despite proliferation of a vascular network on the papilla, the large mass of membranes is seen actually to arise from the superior temporal vein, and here is shown a remarkable increase in the venules. In this case there are two other hemorrhages which have not proceeded to proliferation.

According to Collins and Mayou, the steps of the process are as follows: If the coagulation of the blood is high, coagulation takes place more rapidly than usual and absorption follows slowly. The corpuscles discharge their hemoglobin, the stroma is broken up and cholesterin is formed. The fibrin is either absorbed or becomes organized. The endothelial cells from the blood vessels spread into the vitreous and bands of connective tissue form.

It has been the author's clinical experience to have seen a number of cases of diabetes with retinal disease, and in

those that went on to leakage of the blood into the retina and vitreous, more or less proliferation of connective tissue into the structures was found. So he is of the mind that the endotoxins of the diabetic conditions are a causative factor in the production of the ocular affection, and that laboratory studies would often show diabetes in these cases, and that there is always a change in the blood which promotes extreme coagulability, which is the reason for the slow absorption and subsequent organization into connective tissue.

RETINITIS PROLIFERANS WITH VARICES AND ANASTOMOSES OF THE VEINS OF THE OPTIC DISC.

CASE 1. Y., Robert O., American birth, Pvt., Co. 59, 166 D.B., aged 25, Sept. 5, 1918. Six months before noticed floaters before R.E., when working as farmer. Had facial erysipelas at 15 yrs. Treated by eye specialist previous to enlistment. V.R., 20/30; L. 20/15. V. F.; R., contracted irregularly above; L., normal. Not improved by glasses. History in clinic and ward shows some hemorrhage about region of the R.O.D. Present condition shows unusual picture of thin delicate membrane arising from adventitia of vessel walls with extensive new venous vessel formation, forming at re-

gion of upper temporal vein a true varix. At other places the veins do not anastomose. The focussing on the new vessel formation is +6.00 to +10. D.

CASE 2: S., Mrs. Henry, Jewish, aged 58, March 3, 1921. Has had diabetes mellitus 8 years. Bell's palsy L., 5 years ago. Nearly complete recovery after one year. Now has to pass urine every half hour to hour. Under treatment by Dr Geo. Horton. B.P., 158-over 96. Reduced vision for year or more. Can't get glasses to suit eyes from opticians. A marked example of typical diabetic retinitis in both eyes. V.R., 6/60; L., counts fingers at 1 m. The right is most interesting on account of the new vessel formation. A true varix composed of fine veins over temporal portion right disc and an extensive subdivision of the superior temporal vein, which ramifies thru a membrane overlying the retina +3 or +4 D. On or about the macula will be seen characteristic diabetic spots of degeneration. To the nasal side is apparently the remains of an old hemorrhage from a vein, and below it is a recent fibrinous exudation from an artery with some blood remains. In the left eye there is an extensive proliferating retinitis with many recent hemorrhages.

## SPEED OF ACCOMMODATION AS A PRACTICABLE TEST FOR FLIERS.

MAJOR LLOYD E. TEFFT, M.D., and ELIZABETH K. STARK.

MITCHELL FIELD, L. I., N. Y.

This is the report of an investigation made in the Department of Ophthalmology Medical Research Laboratory and School for Flight Surgeons, Mitchell Field, Long Island. The tests employed seem to have been partly tests of memory as well as of the time of accommodation. It is concluded that other tests which are necessary will exclude those who are disqualified because of slow accommodation unless possibly in cases of presbyopia. Authority to publish from the Surgeon-General, U. S. Army.

**PURPOSE:** It was believed that the speed of accommodation of the eyes possessed by a pilot played an important part in flying, especially in combat work, landings, and other maneuvers in which it was necessary for a pilot to focus his vision from far to near objects and vice versa.

Research work was accordingly undertaken in this laboratory to ascertain the relationship, if any, of the speed of accommodation to other properties of the eyes, such as visual acuity as manifested by the ability to read Snellen test type at 20 feet; depth perception as elucidated by the Howard-Dolman depth perception apparatus; the power of accommodation as determined with the Prince rule; the strength of the internal and external recti muscles as measured by the angle of convergence and the power of prism divergence; retinal sensitivity as obtained from the Cobb retinal sensitivity apparatus. For this purpose sixty (60) subjects were examined, and the results charted and correlated with the various parts of the eye examination given to fliers, as well as with the retinal sensitivity test.

The subjects, according to the results of the eye examination were divided into three classes: (1) a general class embracing both those qualified, and those disqualified because of ocular defects other than speed of accommodation, (2) those qualified, and (3) those disqualified by the examination. Means were established on each of these classes to determine if any candidates, otherwise qualified for flying, would be disqualified because of possessing a low speed of accommodation, and to establish, if possible, a lower speed limit for all cases presenting themselves for examination. Also, it

was desired to ascertain if there were any candidates otherwise disqualified possessing a high speed of accommodation.

**TECHNIC:** The apparatus used in determining the speed of accommodation was the tachistoscope developed by Professor C. E. Ferree of Bryn Mawr College.\*

It is devised so that three test letters (2 near, one at the left, the other at the right, and one far in the middle) are exposed simultaneously to the observer and are then cut off from his view one at a time in a fixed order. "This is done by means of light-weight discs of variable open and closed sectors turned by means of a bar fastened at its center to the axle to which the discs are attached, and provided with adjustable weights on both arms." "The length of exposure can be varied either by changing the width of the open sector or the position of the weights on the arms."

The test letters used were the illiterate "E"s, mounted so that they could be rotated to point in different directions. The working distance of the far test object was 6 meters and of the near test objects 30 cm; the visual angles subtended in each case were 6' 42" and 9' 10". The brightness of the far test card was 10.40 candles per square foot; of the right and left test cards 1.68 and 1.16 candles per square foot respectively.

\*For a detailed description of the apparatus see C. E. Ferree and Gertrude Rand. The Inertia of Adjustment of the Eye for Clear Seeing at Different Distances, American Ophthalmological Society's Transactions, 1918. Edwin B. Goodall. The Speed of Accommodation, Air Medical Service Circular, March 1920.

After a completed exposure, the subject was required to report the direction in which each of the "E"s was pointed. In order to perceive these successfully, he had first to focus on the near "E" at the left, then adjust for the far "E" in the center, and finally accommodate for the near "E" at the right. After a short practice period with slow speed, the exposure times for each letter were gradually shortened until the point was reached where the subject could just discriminate each. Then three correct judgments out of a possible five for a given setting of discs were required. The various exposures; near, near to far, near to far and back to near were recorded in terms of degrees of open sector and converted into time by a process of calibration. In working up the results, however, only the total time required for the complete excursion was used.

RESULTS: The two curves show the distribution of results for the sixty cases examined in our series, and for the hundred cases examined by Goodall.

Table I gives the means and medians together with the probable errors of the results obtained. The means and medians of Goodall's cases, 89 of whom were aviators, have been computed and added for their comparative value.

Table Ia shows these same central tendencies when extreme cases have been omitted by Chauvenet's criterion.

Table II gives correlation values between speed of accommodation and the results of the various phases of the eye

examination for fliers, as well as a retinal sensitivity test and with age.

Table III gives the speed of accommodation and the refractive correction of those cases disqualified because of high refractive error.

DISCUSSION AND INTERPRETATION OF RESULTS: As appears in Tables I and Ia, and the distribution curves, our results were essentially the same as those obtained from Goodall's data. The eliminating of extreme cases from our group renders our mean almost identical with that obtained from his results. Altho the mean time for the 16 cases which were disqualified by the eye examination given to fliers is somewhat higher than that for the 44 cases which were qualified, this difference as measured by its probable error is not great enough to be significant.

Two cases whose speed was so slow as to permit their elimination on the basis of Chauvenet's criterion were

TABLE Ia. EXTREME VALUES OMITTED BY CHAUVENET'S CRITERION.

	No. of cases	Mean P.E. secs	Median P.E. secs
Entire group .....	58	1.528 ± 0.020	1.517 ± 0.025
Qualified by Eye Exam. ....	42	1.496 ± 0.021	1.498 ± 0.026

TABLE II.

Type of test	No. of cases	r	P.E.R.
Visual Acuity, R.E. ....	60	0.307	± 0.079
Visual Acuity, L.E. ....	60	0.326	± 0.078
Depth Perception .....	60	0.336	± 0.077
Prism Divergence .....	60	0.009	± 0.087
Av. Accommodation for 2 eyes .....	60	0.369	± 0.075
Angle of convergence .....	60	0.240	± 0.082
Retinal Sensitivity .....	60	0.167	± 0.084
Age .....	60	-0.331	± 0.078
Age, cases qualified by Eye Exam. ....	44	-0.526	± 0.075

TABLE IIa. EXTREME CASES OF TABLE II OMITTED BY CHAUVENET'S CRITERION.

Type of test	No. of cases	r	P.E.R.
Visual Acuity, R.E. ....	57	0.235	± 0.084
Visual Acuity, L.E. ....	57	0.406	± 0.075
Depth Perception .....	57	0.244	± 0.085
Prism Divergence .....	57	-0.052	± 0.089
Av. Accommodation .....	58	0.204	± 0.085
Angle of Convergence .....	58	0.250	± 0.083
Retinal Sensitivity .....	57	0.210	± 0.085
Age .....	58	-0.097	± 0.088
Age, qualified by Eye Exam. ....	42	-0.166	± 0.111

TABLE I.

	No. of cases	Mean P.E. secs	Median P.E. secs
Entire group .....	60	1.563 ± 0.026	1.525 ± 0.032
Qualified by Eye Exam. ....	44	1.536 ± 0.031	1.500 ± 0.039
Disqualified by Eye Exam. ....	16	1.637 ± 0.044	1.575 ± 0.055
Goodall's Group .....	100	1.526 ± 0.017	1.482 ± 0.017
Aviators, Goodall's Group .....	89	1.505 ± 0.015	1.468 ± 0.022

TABLE III.

Subject	Time secs.		Refraction		L. E.
			R. E.		
G. B. M. ....	1.226	+ 2.25 Sp.		+ 2.50 Sp.	
J. J. M. ....	1.468	+ 1.25 Sp.	( + 0.25 cyl ax 90°	+ 1.25 Sp. ( + 0.75 cyl ax 90°	
J. H. H. ....	1.487	+ 3.00 Sp.		+ 3.00 Sp.	
H. T. D. ....	1.542	- 0.75 Sp.	( + 1.50 cyl ax 90°	- 0.75 Sp. ( + 1.50 cyl ax 90°	
A. C. M. ....	1.698	+ 2.25 Sp.	( + 0.50 cyl ax 90°	+ 2.25 Sp. ( + 0.50 cyl ax 90°	
V. T. S. ....	1.995	- 1.75 Sp.		- 1.75 Sp.	



qualified by the examination. This was undoubtedly a matter of age, as the high negative correlation between speed and age (Table II) becomes practically negligible when these cases are eliminated (Table IIa). The two men were 37 and 39 years of age, and their slow speed is interpreted as being indicative of the initiation of presbyopia.

certain cases, exercise a degree of accommodative effort sufficient to overcome a certain amount of its accommodative deficiency.

Visual acuity, depth perception, and extent of accommodation all show a moderate degree of correlation with speed, but with the omission of extreme cases the correlation between the visual acuity of the left eye and

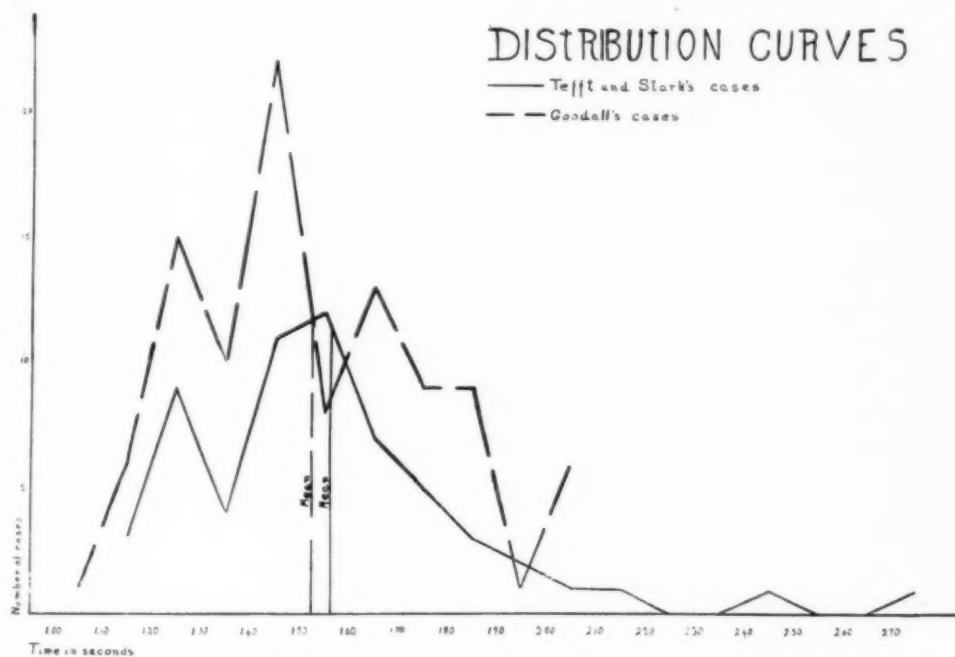


Fig. 2. Graphs showing speed of accommodation in different groups as classified in tables.

It has been suggested that these two cases might have been disqualified, if the disqualifying limit for the power of accommodation were made more rigid. At present, a leeway of two diopters above or below the normal for each age as determined by Duane, is allowed. The normal power of accommodation for the ages 37 and 39 according to Duane's table is 6.8 and 6.2 diopters respectively. The actual power of accommodation of the two cases in question was for the one case, 6.5 D both eyes, and for the other, 5.25 D., R.E. and 5.00 D., L.E. Altho both of these cases are below the normal, they are well within the two diopter limit set. Where the question of speed is not involved the eye can, no doubt, in

speed of accommodation becomes the most significant. The power of prism divergence bears no relation at all to speed of accommodation, as judged from the value of  $r$  obtained; and the correlation between retinal sensitivity and speed is not high enough to be significant.

It will be seen from Table III that the six cases disqualified because of high refractive error have a wide range of speed, one of them falling in the group of the best 15% of the cases and another among the poorest 15%. These few cases show no correspondence between decreased speed and extent of refractive error.

If we were to adopt 2 seconds as the lower speed limit, 4 of our 60 cases

would be disqualified because of slow speed of accommodation, the two qualified cases already discussed and two others which were disqualified by the eye examination. Both of these latter two had defective depth perception, and one had visual acuity of less than 20/20 as well. From Goodall's group this limit would disqualify 6 cases, 4 of whom were fliers.

If the limit were made 1.90 seconds, two more of our cases would be disqualified, making a total of 6. But these two cases were also disqualified by the eye examination, one because of defective visual acuity, depth perception, muscle balance, angle of convergence, and refraction; the other, because of subnormal visual acuity. Turning to Goodall's data, we find that this limit would eliminate 7 of his cases, 5 fliers, whose number of flying hours ranges from 90 to 250.

**CONCLUSIONS:** 1. While this method of testing speed of accommodation is satisfactory in determining the actual speed, unquestionably it is also a test, to a certain extent, of immediate memory. Many of the subjects complained that they could not remember the sequence in which the letters disappeared, altho they felt confident that they had seen all the letters correctly.

2. The apparatus in its present form is cumbersome and the intricacies of operating it are too numerous to make it feasible for use in a routine examination. Another drawback to its use is found in the fact that a large number of subjects seem to find difficulty in adapting themselves to this particular

test situation, and require a long practice period before they can make a correct report of all three test letters. In certain cases, however, it might be used advantageously.

3. While most of the subjects of this series were nonfliers, the results obtained on them do not justify the conclusion that fliers (Goodall's group) possess a materially faster speed of accommodation than nonfliers.

4. While the theoretic importance of the speed of accommodation is recognized, it is believed that those possessing a degree of speed of accommodation which might endanger their flying, possess other deficiencies which can be more easily detected. A possible exception might be found in cases where presbyopia has begun. Since the other tests disqualify the majority of cases with slow speed of accommodation, it is not necessary to establish a disqualifying limit for speed of accommodation. On the other hand, this test could not supplant the routine examination, as a number of disqualified candidates showed better than average speed of accommodation.

5. According to the observations of one or two fliers, this test as given, places much greater strain on the eyes than is required in any flying situation. This is undoubtedly true, since the figures on the dials of the plane are farther away and subtend a larger visual angle than the near "E"s used in the test. If this test were to be adopted as a routine test, it would be better to establish standards using larger test type, thereby more nearly duplicating flying conditions.

## MONOCULAR AND BINOCULAR JUDGMENT OF DISTANCE.

BARBARA VALETTE DEYO

MITCHELL FIELD, L. I., N. Y.

The studies here reported and summarized in Fig. 1 seem to show that binocular parallax is the essential factor in depth perception, and hence that for accurate judgment good binocular vision is necessary. The standard heretofore required might properly be raised. These studies were made in the Department of Aviation, Psychology Medical Research Laboratory and School for Flight Surgeons, Mitchell Field, L. I., N. Y. Authority to publish from the Surgeon-General, U. S. Army.

The material for this article was obtained by Captain Bascom H. Palmer, Medical Corps, ophthalmologist at the Medical Research Laboratory, Mitchell Field, N. Y., from the examination of one hundred subjects comprising airplane pilots, and officers and men of other branches of the service. His problem was to investigate the quality of depth perception judgment, as measured by the depth perception apparatus, and compare the judgments made with monocular and binocular vision. The following data were complete for each subject: (1) ten judgments of depth perception (measured in millimeters) using binocular vision, (2) ten judgments using the right eye only, (3) ten judgments using the left eye only, (4) the visual acuity for each eye, tested by the Snellen test types, and (5) the angle of convergence. In each case it was noted whether the sighting eye was right or left.

The subjects were given the standard examination for flying, and were rated qualified or disqualified on the findings of the examiner.

For measuring visual acuity the regulation Snellen test charts were used, the examinee occupying a chair twenty feet away from the wall upon which the charts were arranged. To qualify on this test the subject must have a visual acuity of 20/20 for each eye. The instrument with which the judgments of depth perception are made is known as the **depth perception apparatus**. It may be described as the front, back and floor of a rectangular box, the sides and top of which are open. The floor is 21 3/4 inches from front to back and 13 1/4 inches wide, and the height of the back and front is 11 1/2 inches. In the front is cut a window whose lower margin is 4

inches from the floor and whose outer margin is 2 3/4 inches from the side of the apparatus. The entire apparatus is painted a dull black and the anterior surface of the back covered with a square of dead white cardboard.

From front to back of the floor of the apparatus runs a scale, ruled off into centimeters and divided into millimeters. Beginning at the front end of the box, the scale is numbered from 500 mm. up to 1450 mm. A dead black rod, 6 inches high and 3/8 inch in diameter, is placed in a stationary position at the point on the scale marked 1000, and a second rod, identical in size with the first, sliding in a groove which runs the length of the box, may be set at any point on the scale by means of adjustable pulleys. The apparatus is placed directly before and beneath the Snellen charts and illumination is provided for both by one 200 watt daylight Mazda lamp, with an angle reflector installed about four feet above and in front of the test charts.

The applicant is seated six meters from the stationary rod in the apparatus. He is first given the opportunity of seeing the rods in the same plane, then by means of lines attached to the pulleys attempts to bring the adjustable rod in the same plane with the stationary rod, after the rods have been widely separated by the examiner. The test is repeated ten times, the subject's estimations of depth difference being read in millimeters directly from the scale.

Care is taken by the examiner to avoid casting a shadow on the background, and to avoid giving the subject any indication as to whether he is doing poorly or well. In order to prevent motion parallax, the applicant should also be instructed to hold his head

straight. An average depth perception of more than 30 mm. disqualifies the subject.

Depth perception or judgment of distance is important in aviation in the making of landings, where the pilot must accurately judge his distance from the ground, trees, buildings, etc.; in low flying for the same reasons, and in formation flying, where he must keep a safe but short distance from other ships.

Regarding the factors operative in judgment of distance, there are some factors common to both monocular and binocular vision, such as terrestrial association, motion parallax and aerial perspective, which are eliminated under test conditions. Accommodation and convergence can also be eliminated. Captain H. J. Howard, in an article called "A Test for the Judgment of Distance" in the Transactions of the American Ophthalmological Society, 1919, says: "The two remaining factors are the binocular parallax and the size of the retinal image. It is possible to obtain the relative values of these two factors by using the same test apparatus, first with two eyes and then with only one eye. In the first instance both factors may operate together; in the second instance, the binocular parallax is eliminated and only the size of the retinal image can operate. This latter is practically as important a factor with one eye as it is with two. If by comparison it be found on the one hand that the results are the same or approximately the same, it is obvious that the size of the retinal image, which operated in both tests, is the important factor. If, on the other hand, it be found that the binocular test produces a far more delicate discrimination than the monocular, we are forced to the conclusion that the binocular parallax is the more important factor, and the size of the retinal image is negligible or practically so."

Bearing these facts in mind, we turn to the results of the depth perception tests. By averaging the ten readings for the right eye, the individual average for each subject was obtained.

The same procedure was followed with the readings for the left eye and for both eyes, and these averages were used in the calculations. The depth perception averages (D.P.) of all subjects were found to be as follows:

TABLE I.

100 cases M (DP)	PEm.	Sigma	C
Right eye...118.30	$\pm 3.92$	58.18	.48
Left eye...118.50	$\pm 4.55$	67.42	.47
Both eyes...18.65	$\pm 1.57$	23.23	1.24
Sighting Eye, (Right, 71 cases; Left, 29 cases)..110.52	$\pm 4.19$	62.12	.56

The great discrepancy between the average for both eyes and the average for either eye alone will be noted at once. The average judgment with the left eye is more than six times as large as the average for both eyes, and the averages for the right eye and the sighting eye are nearly as large. The mean judgments with the right and left eyes are very close, the average for the sighting eye being slightly better.

The probable error of the mean (PEm) gives the measure of unreliability of the mean, and may be defined as that variation from the average which is as often exceeded as fallen short of. It is that amount which added to or subtracted from the mean gives a range within which 50 per cent of the values will fall.

Sigma is likewise a measure of variability. If on the probability curve a distance equal to sigma is laid off on either side of the mean, and ordinates erected from the base line to the curve, two thirds of the total number of measures will be found to fall in the area between the ordinates, base line and curve. The large sigmas in this case (in one instance as large as half the distance estimated) indicate that the probable error of an individual estimate is large, and that the distribution is scattered—a large number of judgments falling wide of the average.

The variability of the different series of measurements may be directly compared by comparing their coefficients of variability (C). These coefficients indicate that the individual judgments made with the sighting eye and with the left eye are equally variable, and



are more variable than the judgments made with the right eye, while the judgments made with both eyes vary more widely than any of the others.

From a survey of these results it is plain, then, that in spite of the wide individual variations in judgment made with binocular vision, the average is far below that made with monocular vision.

The data were next rearranged according to the degree of visual acuity of the subjects. The average depth perception of those subjects having a visual acuity of 20/20 with each eye was obtained, and also of those subjects having a visual acuity of 20/15 with each eye. A similar average for both right and left eye was made for those subjects with a visual acuity of 20/20 and 20/15 respectively. The results of both groups are presented here for comparison.

which is more than eight times its probable error and therefore a reliable indication that there is a definite relationship between the two, and that improvement in the former is associated with improvement in the latter. After applying Chauvenet's criterion to eliminate the extreme cases which were not typical of the group, the mean of depth perception was found to be  $16.27 \pm 1.02$ , which is lower than the average formerly obtained for all cases, and the mean of visual acuity was 20/15 +1 which is a high average. Inasmuch, then, as more than two-thirds of the subjects possessed a visual acuity considerably above the requirements demanded, it is evident that the degree of visual acuity considered a necessity for fliers is not excessive for the material available.

The fact that one mean is higher than another does not necessarily indi-

TABLE II.

	Cases	M (DP)	PEm	M Dif.	PEd	C
Right Eye.....20/20	29	129.68	$\pm 7.91$	27.34	$\pm 6.33$	.48
20/15	60	102.34	$\pm 4.74$			.53
Left Eye .....20/20	18	151.94	$\pm 13.70$	40.12	$\pm 12.78$	.55
20/15	64	111.82	$\pm 4.93$			.52
Both Eyes ....20/20	16	28.11	$\pm 1.96$	16.09	$\pm 1.74$	.64
20/15	57	12.02	$\pm .90$			.83
All Others ...	26	26.92	$\pm 3.81$			

One striking fact brought out by this table is that there were approximately three times as many subjects with 20/15 vision, or better, as with 20/20, altho the latter is considered normal. It must be remembered, however, that the great majority examined were young men, the group average being 28.9 years. Those individuals with 20/15 vision were also better in judgments of depth perception than were the subjects having 20/20 vision, altho the variability is about the same for each series of measurements. Particularly in the series for the left eye and for both eyes is this difference noticeable, indicating that the keener the vision, the more accurate would depth perception judgments tend to be. A correlation between these two factors of depth perception and visual acuity gave a result of  $.457 \pm .053$ , a figure

cate a true difference between the means. A glance at the table of comparison shows that this difference is considerable, but the degree of reliability of that difference is determined by the size of the probable error of the difference (PEd). To determine a satisfactory degree of reliability, the difference of the means should exceed the probable error of the difference by at least three times, so it is apparent that the probable error of the difference of the means for both eyes ( $16.09 \pm 1.74$ ) is particularly significant, as the difference of the means exceeds it by more than nine times.

The subjects were next divided into two groups; (1) those qualified to fly and (2) those disqualified because of poor visual acuity, low angle of convergence, muscle imbalance, color blindness, etc. The average depth percep-

tion judgments for each group were obtained and they were found to differ widely. The mean in millimeters for the qualified group was  $11.93 \pm .52$

average is significant. After eliminating one extreme case in this group, the average is still 29.66 mm. The results show that the subject disqualified on

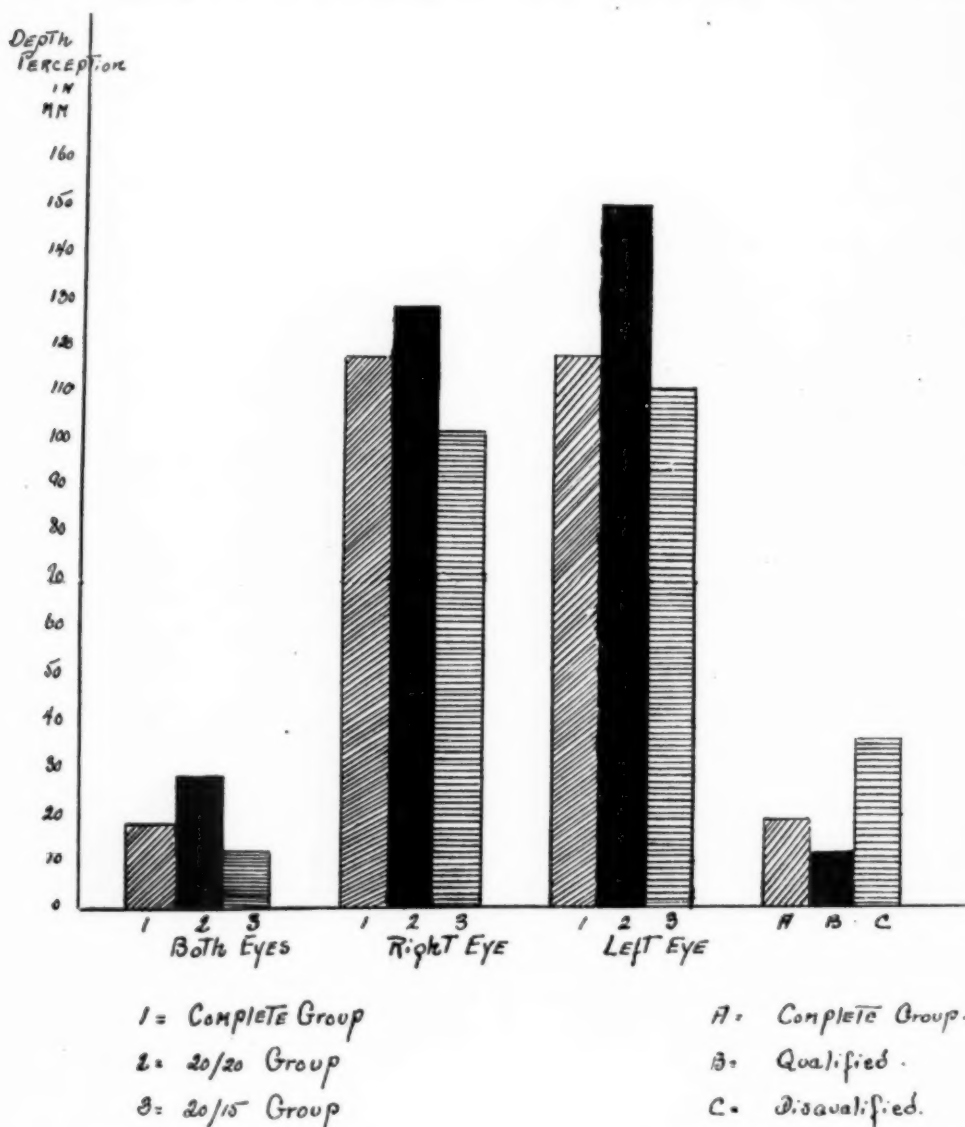


Fig. 1. Graphic representation of results of tests of monocular and binocular judgment of distance. Figures on left indicate distance one rod must be in front of the other for recognition, D P in mm.

with a coefficient of variability of .54 and the average for the disqualified group was  $36.30 \pm 5.72$  and a coefficient of variability of 1.28. As more than 30 mm. disqualifies in the depth perception test, the size of the latter

any ophthalmologic findings is apt to have a depth perception average near the disqualifying limit and to make erratic judgments varying widely from the normal average. The qualified man, on the contrary, has an aver-



age depth perception far better than the standard requirements, and his judgments are more constant and reliable.

Of the thirty disqualified subjects, nine failed to attain the required average of 30 mm. in depth perception, but in only one of the nine cases was the failure of depth perception the sole disqualifying factor. The remaining twenty-one subjects had a qualifying depth perception average but were disqualified for other causes, such as paralysis of the eye muscles, poor visual acuity, more than the allowable amount of hyperphoria or esophoria in conjunction with diplopia, etc. The fact that the mean for all thirty subjects is outside the qualifying limit, and even excluding one extreme case is 29.66 mm., shows that the readings in the majority of cases is very close to the disqualifying mark. The results indicate also that inability to judge depth perception distance with a normal degree of accuracy is quite closely associated with faulty ocular function.

The average angle of convergence for all subjects was found to be  $58.9^{\circ} \pm .98$ , and an attempt was made to discover a possible relationship between this angle of convergence and the diopeters of accommodation of the right and left eyes, but as some of the necessary data were lacking in many cases, the results were wholly unreliable. This outcome was not altogether unexpected

as the readings were all taken at twenty feet.

A graphic representation of the comparison of the averages of the depth perception judgments of the two groups of subjects, based upon their degree of visual acuity, with the average for the complete group is presented above. The great difference in judgments of depth perception made with binocular and with monocular vision would tend to prove that it is the binocular parallax which is the all important factor in depth perception judgment, and that the size of the retinal image, which operates in monocular vision is of practically negligible importance in judgment of distance. It is plain that for accurate depth perception judgment good binocular vision is necessary, and the results of these tests show that the better the visual acuity, the more exact the depth perception judgment tends to be. As the average—with both eyes—for all subjects both qualified and disqualified is 18.65 mm., it would seem that the standard which designates 30 mm. as a minimum depth perception requirement is not too high. On the contrary, from a consideration of the average for the complete group and for the qualified group, which is 11.93 mm., it is probable that the standard should be raised, and a minimum depth perception average of 25 mm. or 20 mm should be required.

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## OBSERVATIONS CONCERNING THE CAUSATION OF SIMPLE GLAUCOMA.

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This paper explains and upholds the view that simple glaucoma depends upon changes in the vitreous, especially upon swelling of the vitreous body. Such essential condition is not removed by treatment that may give temporary relief from the more prominent symptoms.

Simple glaucoma is an ocular state which results from swelling of the vitreous body. Closure of the Fontanic drainways is no more its cause than is cupping of the optic disc. Both of these pathologic entities are the immediate results of the swelling of the vitreous; each is responsible for its own set of symptoms, which in turn are a part of the complete syndrome. Swelling of the vitreous body is to be compared with swelling of the crystalline lens. Both have the same causes, so-called age changes or an as yet undetermined state of the blood. As in the lens, so in the vitreous, the degree of the swelling is limited by the nature of the body and the processes which produce it. *The actual possible increase in both is small.* Moreover, simple glaucoma is bilateral, and, as a rule, does not appear prior to the time of life when the so-called presbyopic changes have occurred in the crystalline lens. Such is my belief in regard to the nature of simple glaucoma, and the more I reflect upon the problem the clearer its details become.

It was my fortune to have under my care within a few months thirty or more eyes affected with either simple glaucoma, or with simple glaucoma to which was superadded an acute phase. Each case was the cause of much reflection on my part, and as those cases succeeded one another they only served to make clearer the conviction as to the nature of this truly to be dreaded ocular disease. In the discussion to follow, I must admit at the outset that I have no microscopic proof of my belief; nor have I been able to devise a plan by which, with the limited laboratory facilities at my command, I can produce such proof. My deductions were obtained by envisaging each case as it came and by attempting to ex-

plain the conditions present in each by one or the other of the many theories which ophthalmology has suggested. When finally I came to the conclusion that swelling of the vitreous body and that this alone is the cause of simple glaucoma, I could not recall that I had ever seen in my medical readings mention of the possibility of such a process affecting the vitreous. Nor have I since seen this mentioned as the cause of the disease under consideration.

Fluidity of the vitreous is a well recognized condition. It varies in degree. It is coexistent with a normal, subnormal or increased intraocular tension, as measured with the tonometer. Its pathology must consist in the disappearance of certain of the vitreous elements and their replacement, in so far as the condition of the ocular tissues, including that of the ciliary processes, will admit, by the aqueous fluid. Increased intraocular tension as the result of increase in the amount of the aqueous within the eye is well recognized e.g. in cases of buphthalmos. Here we have congenital absence of the essential elements of the Fontanic system. This, however, is not simple glaucoma.

I am rather inclined to think that contemplation of the pathology of the congenital type of so-called glaucoma has had much to do with the misappreciation of what goes on in simple glaucoma. These two types of glaucoma are of entirely different pathology. As I see it, the one shows increased intraocular tension with increased volume of retained aqueous as the result of absence of the essentials of the Fontanic channels; the other shows increased intraocular tension primarily as the result of swelling of the elements of the vitreous substance. The higher than normal tension here is increased by

blockage, from pressure of the vitreous, on the exits in the Fontanic system. The increase in the amount of excess aqueous in the anterior chamber is small. The anterior chamber has little tendency to deepen and for two reasons: (1) The aqueous is as incompressible as the vitreous. (2) The ocular envelopes can withstand evenly distributed pressure from within higher than the glaucomatous process develops. (The local exception to this statement is found in the lamina cribrosa).

It has often been noted that simple glaucoma may exist in the presence of either a deep or shallow anterior chamber. The apparently deep anterior chamber is not deep because of the increased amount of aqueous therein. I have never seen a case where the depth of the anterior chamber was greater than is to be seen from time to time in normal eyes. We have been accustomed to expect a shallow anterior chamber in glaucoma of the acute inflammatory type, and when we see a deep chamber in any type of glaucoma it is a matter of mental comment. The shallow chamber in simple glaucoma may be only a normally shallow chamber, or it may represent a relaxation of the suspensory ligament of the lens as the result of the pressure of the vitreous plus sudden inequalities of escape of the aqueous.

In buphthalmos retention of the aqueous results in increase in the size of the whole ball, not only of the anterior chamber—in this disease the aqueous is forced thruout the vitreous substance; the yielding of the ocular tunics is the result of the fact that the tissues of the eyeball lack the resisting properties which later in life they acquire. Increase in size of the vitreous is followed in the course of time by liquefaction of the vitreous. In what does liquefaction of the vitreous consist? In the disappearance of certain essential elements of the vitreous body and their replacement by the secretions from the ciliary processes, i.e., the aqueous.

Why, then, does not the high tension of simple glaucoma disappear after partial liquefaction of the vitreous sets

in, if simple glaucoma be due to swelling of the vitreous elements, or, again, if simple glaucoma be due primarily to a swollen vitreous, why cannot a normal or subnormal tension be maintained after removal of a part of the vitreous? I think the answer to these two questions is to be sought in the pressure effects of the swollen vitreous in its enveloping membrane on the channels of exit in the Fontanic angle. The months long, or years long unrelieved pressure results in a proportionate obliteration of these drainways. (An argument for early operative intervention). For a considerable, probably a long time after the processes which result in swelling of the vitreous elements have set in, the discomforts they cause are too vague to be referred by the patient to their proper source. The result is, when the patient comes for examination the oculist is confronted by an old process, one that in every case has resulted in marked obliteration of the ultimate channels of exit, most frequently by cupping of the papilla, in many cases by a varying degree of liquefaction of the vitreous body. Bearing these things in mind, we can see that the success of our operative efforts will be measured by the degree of our success in reopening the closed Fontanic channels.

Thus, for example, in cases where the swelling of the vitreous has never been great enough to cause a tension above 38 or 40, where for the greater part of the time since the glaucomatous process has set in, the tension has remained below 35, where the eyeball is relatively large, where it has never been subjected to unrelieved subacute or acute exacerbations, a large peripheral iridectomy will, as a rule, (even tho the tension be only slightly reduced as a result of the operation) prevent for a long time (I have known it to do so for twelve years) further demonstrable deterioration of the vision or visual field, and this in the presence of a glaucomatous disc. What an iridectomy has accomplished is the removal of a part of the *solid portions* of the intraocular structures. This permits a readjustment of the lines of pressure of the swollen

vitreous and the partial reopening of the as yet not permanently closed channels of exit.

Where, however, the swelling of the vitreous is so great as to result in a very high intraocular tension, and this has persisted so long as to permanently glue together the minute channels of exit, an iridectomy, no matter how well executed or how large, will fail to permanently reduce the tension. With these facts in mind we can see why in one case an iridectomy fails and in another is a success.

In considering what takes place when the vitreous body swells, we must bear in mind the impermeability of its limiting membrane; witness, for example, the picture seen in thrombosis of the central retinal vein or its major branches. Here in spite of marked local retinal edema, with excessive bending of the venous branches and the concurrent hemorrhages, we find no edema or blood in the vitreous. There is nothing in the clinical pictures or histories of the well known inflammatory conditions affecting the cilio-corneal region which lends itself to the belief that simple glaucoma is of inflammatory origin. Where in acute iridocyclitis, as is occasionally the case, the intraocular tension rises above the normal, there are pain or redness and external and internal visible conditions which are never seen in uncomplicated simple glaucoma. In simple glaucoma, for a long time after the process sets in, there is no visible trace of external congestion of the sclera or conjunctiva about the corneal ring; the pupil reacts normally; the range of accommodation is not demonstrably lessened; the vision remains normal; the field of vision remains uncontracted; indeed, were there not means of detecting the existence of a higher than normal intraocular tension, we should be left with the indefinite nervous symptoms, including headache and aching of the eyeballs which follow attempts to use the eyes for close work, as the only symptoms we could detect. In this stage of the disease, we are faced with a problem whose only symptoms are noninflammatory rise of intraocular tension and

eyestrain. The eyestrain is manifestly the result of the increased tension; therefore we have to seek a cause for only one thing, viz., increased tension. This must come from one of two causes, increase in size of the vitreous body or noninflammatory closure of the Fontanic exits.

Now, whatever our hypothesis may be, it must have as its basis a terminal condition, for primary glaucoma having once been established continues thru life. It is an incurable as are the age changes in the crystalline lens. It cannot originate in loss of function of the iris or ciliary movements, or atrophy of the ciliary glandular elements, for these continue to function until atrophic degeneration from pressure sets in. I know of nothing which would properly suggest paralysis or disturbance of the sympathetic control of the cilio-glandular system as a possible cause. Section of the sympathetic does not result in primary glaucoma. Swelling of the lens cannot be the cause, for simple glaucoma occurs and may last a long time without any demonstrable refractive changes. As far as I can see it then, we must look for changes in the vitreous body as the cause of simple glaucoma.

That the crystalline lens swells or diminishes in size as the result of what we term age changes is well known. That the vitreous body tends in old age to develop changes which result in fluidity is also a well recognized chapter of its life history. That a possibility exists that it may undergo changes which result in its general enlargement from swelling of its essential elements must at least be admitted. That these changes may be followed later by atrophy of the hypertrophied or swollen elements with a resultant liquefaction of the vitreous is highly probable. That changes similar to those which occur in simple glaucoma take place in the vitreous of all eyes in the later years of life is to be admitted. The degree of these changes determine the presence or absence of simple glaucoma. That other causes than age changes may result in swelling of the vitreous elements is probable, but



whether this be the result of certain endocrin insufficiencies or of toxins in the blood, I cannot say. Probably the former is the correct answer.

If then we grant that swelling of the elements of the vitreous body is a pathologic possibility, we have a solution of the cause of simple glaucoma. In reading what is now immediately to follow, we must bear in mind that we have confined our comments entirely to those stages of simple glaucoma which precede the irritative or inflammatory complications, for these latter are rendered possible as a result following the pressure of the enlarged vitreous, and are in no sense responsible for the primary swelling of the vitreous. The pressure of the swollen vitreous is exerted equally in all directions. Its pressure posteriorly results in forcing backwards of the lamina cribrosa with a resultant cupping of the disc, which in turn forces against the edge of the cup the retinal fibers and their blood vessels. As a result of this we have (1) atrophy of the retinal fibers with changes in the visual field; (2) compression of the arteries and veins, which produces circulatory disturbances in the retinal vessels, which are especially noteworthy where, as often is the case, these vessels are the seat of sclerotic changes. The lateral pressure of the swollen vitreous is most noticeable when it is sufficiently high to obstruct wholly or partially the exits of the venae vorticosae, and is then represented visibly by the dilatation of the middle episcleral veins. Closure of the exits of the venae vorticosae in itself is followed by increased intraocular tension, but where this occurs as the result of swelling of the vitreous we must bear in mind that the simple glaucomatous condition is not the result of the obstruction of the exits of the venae vorticosae but of swelling of the vitreous itself. The anterolateral pressure is exerted against the Fontanic area, i.e., the sclerocorneal region. This produces flattening of the ciliary processes and proportionate closing of the channels in the Fontanic system, with a forcing forwards and outwards of the root of the iris.

That the closure of the ultimate channels of exit for the aqueous is *for a long time* not the result of the presence of fibrinous deposit therein, but is solely the result of pressure, is proven by the fact that the use of eserine is so often capable of producing a marked reduction of the intraocular tension. Were the channels blocked with a fibrinous deposit, eserine could produce no such result. (Here we have a test which will help us to decide for or against the use of iridectomy in many cases.) Where the pressure of the swollen vitreous has been great (for the degree of swelling of the vitreous varies in different eyes) and has lasted for a considerable time, the result is permanent closure of so great a proportion of the Fontanic channels of exit, that the use of eserine does not reduce the intraocular tension, nor will iridectomy afford relief. Again, there is clinical evidence that sclerocorneal trephining is often followed by a gradual opening of a part of the closed channels of exit. This is to be expected. Lastly we have the picture presented in simple glaucoma in those cases where in the presence of high tension the lamina has not yet given way. The pressure of the vitreous against the retina produces an amblyopia without any contraction of the visual fields. Here at first the amblyopia is transient, lasting for periods of varying duration, and recurring at intervals of different length. I have seen in one case, notable among the cases under my care, the vision increase from 18/200 to 18/15 in a few moments after the instillation of eserine.

A few words must be added about the irritative and inflammatory stages of simple glaucoma, and I think much of the confusion which exists in regard to the causation of this disease is due to the fact that these complications have not always been clearly recognized as one of the results of the increased intraocular pressure, as much so as cupping of the disc or blockage of the Fontanic channels. In our treatment of simple glaucoma we must bear clearly in mind that doing away with the ir-

ritative or inflammatory symptoms does not cure the disease. In the presence of the pressure exerted by the swollen vitreous against the cilio-iridic region, the ciliary muscle readily tires (witness the easily produced eyestrain of the simple glaucomatous eye). This functional exhaustion disposes the ciliary region to active congestion, if the blood contains an undue proportion of toxins from foci of infection. This congestion may be slight or severe and

hence the irritative or the so-called inflammatory types. *Removal of the foci of infection, if done in time, is followed by disappearance of the irritative or inflammatory stage, but the process known as simple glaucoma remains present as before.* We have in the above the explanation of the so-called cures of acute glaucoma following extraction of a tooth, or opening and draining of a nasal air chamber, which from time to time have been reported in medical literature.

### CLINICAL OBSERVATIONS ON INCREASED INTRAOCULAR TENSION.

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The differentiation between glaucoma and uveitis with increased intraocular tension is sometimes very difficult, altho text-books fail to point this out. This paper reports a series of cases in which the tension was reduced to normal and permanent cure secured by the use of mydriatics. Read before the Chicago Ophthalmological Society, February 20, 1922. See p. 379.

It is not the intention of this paper to open a general discussion on the subject of glaucoma, but to review a study of the following cases which will illustrate the difficulty frequently encountered in differentiating some of the cases of uveal inflammation which come under observation from cases of primary glaucoma. If we read either a modern text-book on ophthalmology, or one published twenty years ago, the conclusion arrived at will be that the two conditions—iridocyclitis and glaucoma—have well marked differential points, which enable one to make a diagnosis at once. Yet this is a question which often gives not only the student but also the trained ophthalmologist the most concern in practice. Time and again this question presents itself, and we are all called upon to make a decision which is difficult as well as extremely important.

Classical cases are, of course, readily recognized, but the atypical cases are the difficult as well as the interesting ones. We are all aware that every eye which has increased intraocular tension is not affected with glaucoma, and we should keep this fact firmly fixed in our minds, since it often happens that increased hardness of the eyeball is such

an outstanding feature in the case under observation that it seems to engage our entire attention, even to the exclusion of all other symptoms, and primary glaucoma is our first and only thought; and following on in this direction miotic treatment is at once resorted to, sometimes with disastrous results, whereas mydriatic treatment would have saved the day. The following cases are illustrative of this point and are submitted for that purpose.

Case 1. Many years ago a young man 22 years of age came under my observation, who had been suffering with severe pain in the left eye for a number of days. The pain was so severe when I first saw him that he was nauseated and had been vomiting most of the time during the previous days. I found his pupil partly dilated, the anterior chamber practically obliterated, eyeball hard, and the lens somewhat opaque. He had been struck on the eye by the ramrod of a toy pistol about twelve days previously. There was apparently no rupture of the anterior capsule of the lens and no lens matter could be seen in the anterior chamber.

I reasoned that the capsule had been ruptured posteriorly and that the lens swelling had pushed the iris forward



and obliterated the sinus angle, and since his lens had not attained its complete growth at 22 years of age, I would attempt complete dilatation with atropin, and if that could be accomplished it would restore drainage from the posterior to the anterior chamber and probably open up the sinus angle.

I accordingly began with alternate instillations of cocain and atropin, and within four or five hours his tension and pain were relieved and he ran the usual course of a case of traumatic cataract, except that there never was any lens matter in the anterior chamber at any time, absorption taking place posteriorly until there was nothing but a capsule remaining. This was my first experience of this kind and I was very much impressed with the fact that altho the swollen lens was not removed, the hypertension was relieved immediately and permanently by the use of atropin.

Case 2. In the spring of 1898 a man of 35 years came to me with a well marked iridocyclitis. He had a history of lues and many corroborative symptoms of the disease. He was put on atropin and specific medication and made very satisfactory progress for about three weeks, pupil dilated readily and evenly and his pain was relieved. Then the eye suddenly became painful and tender and the tension became  $+$ . Leeching was resorted to, but without relief of either pain or tension. Atropin was suspended and the pupil rapidly contracted; at the same time the anterior chamber became deeper than previously, the aqueous became cloudy and the tension and pain increased. Atropin was resumed with some improvement in the tension and was pushed vigorously; the pupil dilated rather surprisingly and there appeared to be no adhesions whatever, but numerous fine precipitates on the lens and posterior surface of the cornea. A paracentesis was done with almost magic relief, tension remaining down and recovery promptly taking place. Evidently a case of what we used to call serous iritis, the turbid aqueous being the probable cause of the hypertension.

Case 3. A babe of 2 1/2 years brought with congenital cataract in both eyes. Right eye needled and three weeks later left eye needled. Eight or ten weeks later right eye needled again with rapid absorption of lens matter for a number of weeks, then pupil became difficult to keep dilated and later tension became elevated and the eye became red and painful. At this time the anterior chamber was quite shallow, tho there seemed to be nothing but capsule remaining. A capsular discission was made on the theory that the iris was adherent to the capsule and chamber communication shut off. No relief was afforded by the opening thru the capsule and two days later an iridectomy was done. A very free gush of aqueous followed the abscission of the iris, and relief was prompt and permanent.

Here apparently the aqueous was secreted into a closed pocket formed by the iris anteriorly, the thickened lens capsule and zonule posteriorly and nearly or quite surrounding the pupil. After the iridectomy the pupil dilated readily with atropin and a good result was secured. The above cases antedate the tonometer, thus tonometer records were not made.

Case 4. Mrs. M. S., age 43. Came complaining of blurred vision in left eye for previous week, with occasional severe pain above the eye; had similar trouble sixteen or seventeen years ago. R.V.=20/25, L.V.=20/100; L. eye congested, anterior scleral vessels much distended and pupil slightly dilated; reaction to light sluggish, anterior chamber deep, T decidedly  $+$ , media clear and fundus normal. R. field normal, left field contracted 20° in nasal portion; with tonometer T.=75. Such high tension with pupillary reaction was so unusual that I secured another tonometer, thinking my instrument might be at fault, and on restoring found T.=75, the same as with my own Gradle tonometer. Arterial pulsation was not present, but could be produced by pressure on the globe. There was a small posterior synchia below, which the patient stated had been present since the first attack of the trouble.

On account of the deep anterior chamber I decided to carefully use a mydriatic and accordingly applied five instillations of 2% homatropin with two instillations of 4% cocain. At the end of ninety minutes the pupil was dilated widely, and T. was reduced to 60, a drop of 15 mm. A careful examination of the cornea, lens and media showed them to be entirely free from exudates. Scopolamin hyd. brom. grs. 1 to 5i was ordered every two hours, a leech was applied to the temple and a course of calomel and saline was given. The next day T.=50, less pain and blurring, and in four days tension was 24, with vision 20/30, and entire freedom from pain. The tension remained at this point for one week when it decreased farther recording 10 mm. with the same tonometer. About this time a few deposits appeared on the lens and in the vitreous, but none could be seen on the posterior surface of the cornea. This patient had a ++++ Wassermann and a number of dead teeth with apical infection. But she had practically recovered from her eye condition before any of the teeth were extracted. She had been given about eight or ten rubs of ung. hydrarg. up to this time. The eye remained well and she had her bad teeth removed as well as continuing her treatment for lues. When last seen by me, which was about nine weeks after the onset of her trouble, her vision was 20/25, T.=18 to 20 and field of vision normal.

Case 5. Mr. R., age 24. Came with a history of loss of vision in his left eye dating back about two months. The eye showed evidence of inflammation and was quite painful at times; the anterior chamber was shallow, pupil was contracted, and there were a few deposits on the posterior surface of the cornea, at from five to seven o'clock. A distinct circumcorneal injection was present and tension was 54 mm.

This patient had in his possession a 2% sol. of pilocarpin, and 5% sol. of dionin, which had been ordered by a local ophthalmologist. Vision was light and shadows only, and fundus could not be seen on account of the

contracted pupil and the great number of vitreous opacities which were present. A diagnosis of uveitis was readily made and the use of a mydriatic was determined upon. Accordingly homatropin 2% was ordered for instillation every hour, the patient was leeches and put to bed.

I saw him again in the evening and found the pupil fairly well dilated and the tension somewhat reduced. Scopolamin was substituted for homatropin and the next day tension had dropped to 42; scopolamin was continued for another 24 hours and was then replaced by atropin, the tension having dropped to 30. In the meantime a blood Wassermann showed negative, and a badly diseased pair of tonsils were found as the only apparent cause of the trouble. These were removed and a rapid recovery from the acute process followed, leaving only the results of inflammatory exudation, which slowly disappeared with the exception of the vitreous opacities, but with no return of the hypertension. When last seen vision =20/65 with -.75 sphere. This was about three months after his first visit to me. There were quite a few floaters remaining in the vitreous at this time. Two and a half years later this patient had vision of 20/25 with -1.25 C- .75 ax. 165. No vitreous opacities present.

From a study of these cases it will be seen that the anterior chamber may be either shallow or deep, depending on the pathology present. If the lens or lens capsule is involved, or if there is posterior or peripheral anterior synechia the chamber will appear shallow. This is particularly true if the disease has been present for some time before proper mydriatic treatment has been instituted, or if it has been difficult to obtain proper absorption of the drug; while the chamber is usually deep in the earlier stages of the disease, which condition is probably due to the freedom of communication between posterior and anterior chambers, which exists at this time, and an increase in the albuminous contents of the aqueous, which varies considerably in different cases.

The pupil may be dilated to some extent, as in cases one and five, but is most often dilated in the cases where the anterior chamber is deep, and in which the tension seems to be due to the increased viscosity of the aqueous; while a contracted pupil is usually present along with a shallow anterior chamber and the hypertension is due to the crowding forward of the iris and evident blocking of the sinus angle.

Just what influence swelling of the ciliary body has on the production of tension in these cases, is somewhat difficult to determine, tho tenderness in the ciliary region is often most pronounced in the cases which later develop minus tension.

In attempting to isolate the cases in which mydriatic treatment may be logically and safely applied in the presence of + tension, one must take into consideration the following points:

1. The age of the patient (young and middle aged individuals being in the majority, while primary glaucoma is peculiar to advanced age).
2. The history of the case, which in-

cludes the absence of prodromal symptoms, which, according to Weeks, are present in about 75% of the cases of acute glaucoma.

3. The involvement of one eye only, while primary glaucoma most often affects both eyes.

4. The lack of corneal haziness and anesthesia, but the presence of either cloudy aqueous or other distinct evidence of exudation.

5. In the majority of cases a deep anterior chamber.

Of course, ciliary tenderness and other common evidences of iridocyclitis must be taken into account.

In closing I cannot refrain from observing that while some of these cases may require iridectomy for their relief (e. g. eyes that have annular posterior synechia, or anterior peripheral synechia), I am firmly convinced that some of the cases of so called acute primary glaucoma which are cured by iridectomy belong to this class, which if treated early and vigorously with mydriatics would have made an equally good recovery.

## THE ANGLE ALPHA.

E. LANDOLT, M.D.

PARIS, FRANCE.

This article explains and defends the earlier attempts of its writer to make more definite the understanding of the angle alpha and the factors that influence the apparent deviation of the cornea from its normal position.

In the report of the Committee on "Collective Investigation Concerning the Ocular Muscles" to the Section on Ophthalmology of the American Medical Association, I have just read (p. 277 Presession Volume) the following statement:

"From the earliest days of ophthalmology we have been taught that except in low degree of myopia, the optic axis AA' meets the visual axis OF at an angle AXO, which angle has long been known as the angle alpha. . . . Unfortunately Landolt did not follow the example of Donders in calling the angle made by the optic with the visual axis the angle alpha. Instead he gave the name to the angle OXE.

The result was that the later writers . . . have tried to clear up this confusion by referring to the "angle alpha of Donders" as one, and the "angle alpha of Landolt as another angle."

The diagram explaining this assertion happens to be taken from my work: "The Refraction and Accommodation of the Eye," Fig. 52, p. 117. I reproduce it here with its original footnote.

It is self evident that the text in my book gives full and clear explanation of these points, lines, angles, etc. Moreover, at the foot of the page I have quoted passages from the works of Donders, Helmholtz and others, from

whose writings I drew my descriptions.

First of all, I state that the writers of this article have not even understood my figure or my explanations. The fact is the optic axis  $AA'$  meets the

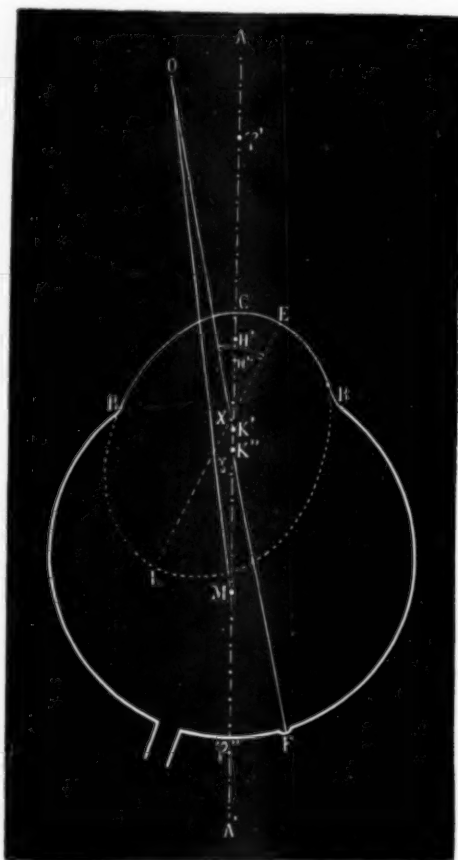


Fig. 1. The figure is made very schematic, in order that the angles  $\alpha$  and  $\gamma$  may be rendered more apparent.  $A A'$ , optic axis;  $\phi$ , anterior focus;  $\phi'$ , posterior focus;  $H H'$ , principal points;  $K' K$ , nodal points;  $M$ , centre of rotation;  $C$ , centre of the cornea;  $B B$ , base of the cornea;  $E L$ , major axis of the corneal ellipsoid;  $F$ , fovea centralis;  $O$ , point of fixation;  $K' O$ , line of vision;  $M O$ , line of fixation;  $O X E$ , angle  $\alpha$ ;  $O M A$ , angle  $\gamma$ .

visual axis  $OF$  not in the point  $X$ . This point is situated on the major axis of the corneal ellipsoid, whereas, as I say: "The line of vision has no common point with the optic axis, only the nodal points  $K'$  and  $K$ ."

According to their definition the angle  $\alpha$  would therefore be  $AK'O$  (and not  $AXO$ ). But what is Donders' definition of the angle in ques-

tion? Is it the angle between the optic axis and the visual axis?

Let us look at his classical work published in 1864 by the Sydenham Society. Page 182 he says: "The angle between the axis of the cornea and the visual line," the same on pages 297 and 299, everywhere it is a question only of the relation between the *corneal axis and the visual line*.

Let us also consult Helmholtz "Physiologic Optics." In the first edition 1862, p. 8, he says: "Senff calls  $\alpha$  the angle between the summit of the ellipsoid (of the cornea) and the end-point of the axis of the eye." Helmholtz adds: "Senff means probably by 'axis of the eye,' what we shall define later as 'visual line.'"

In fact on page 11 Helmholtz says: "The angle between the major axis (of the corneal ellipsoid) and the visual line."

The same definition is to be found in the second edition of Helmholtz on page 18, and in the third edition on page 12. Everywhere the angle  $\alpha$  is defined as the angle between the axis of the cornea (and not that between the optical axis of the eye) and the visual line.

All those who know of Donders and Helmholtz more than their names, know this; they moreover understand the importance in the research of the dioptric system of the eye of the angle formed by the major axis of the corneal ellipsoid and the visual line.

An analogous importance belongs to the  $\gamma$  in the investigations of the rotation of the eyeball.

It is true that the interest attached to these two angles is rather of a purely scientific nature. I would not say, however, with Savage (Ophth. Rec. 1909, v. 18, p. 546) "that the sooner these angles are forgotten the better." One cannot forget what one has never known; but at least it would seem proper not to speak of things which one does not know.

Descending from the scientific spheres to the domains of ordinary practice, I suppose that savants of the earlier days of ophthalmology have perhaps meant to speak of an angle which not infrequently



produces *apparent strabismus*, that is to say the angle between the direction that an eye has in reality, and the direction it appears to have.

The first of these two directions is the *visual line*, which unites the point fixal with the center of the fovea. The second is the *axis of the pupil*; for it is on the pupil that one sees (and not on the summit of the corneal ellipsoid, or on the optic axis of the eye which one does not see) that is based the apparent direction of an eye. (Think of how we judge the direction of the eyes in a portrait.)

It is this angle and not the angle alpha that in practice we easily de-

termine by the perimeter. (See Norris and Oliver's System of Diseases of the Eye, v. 4, p. 46.) It produces an apparent divergent strabismus when the pupillary axis passes outside (on the temporal side) of the visual line; or an apparent convergent strabismus when the pupillary axis passes to the inner (nasal) side of the visual line. I have given this angle the name of kappa. But I entirely disclaim the paternity of an angle alpha. There is only one angle alpha, i. e., the one of all those we have made a study of the dioptric system of the eye, and which is explained in the pages quoted from my work.

## ERRORS IN OPHTHALMIC LITERATURE.

JAMES MOORES BALL, M.D.

ST. LOUIS, MO.

A number of the errors that are frequently repeated in ophthalmic literature are here pointed out and made the basis of a plea for more careful study of what has been published in the past, before putting forward ideas as new.

Somewhere, in his voluminous writings, Kipling has this virile couplet:

"The sins ye do, two by two,  
Ye pay for, one by one."

The sins (errors) of ophthalmic writers do not run "two by two," and are not paid for.

Trifling as they may appear to be, they are not necessary, and they should be eliminated. The short cut to authorship tends to perpetuate errors which could be avoided if the literature were carefully studied. Precision and exactness are the watch dogs of ophthalmology—of its literature, as well as of its practical application to the diagnosis and treatment of disease.

In delving into the literature while preparing the manuscript for a new edition of a text-book, the writer has had two thoughts come to his mind:

1. The ancient is always old, but the new not always of recent origin; and,

2. Errors, as regards dates, facts, the spelling of names, the citation of references, etc., are handed down from one generation of ophthalmologists to another, without question.

The writer has not the time to elucidate, nor would it be advisable to consume the space in this JOURNAL to verify, the reasons for the *ex cathedra* statements which follow:

A. CONCERNING THE CILIARY MUSCLE.—In 1846, Ernst Wilhelm Brücke (1818-1892) described the ciliary muscle ("Ein neuer Muskel im Auge." *Med. Zeitung, Berlin*, 1846, XXV, 130). Probably he did not know that the muscular nature of this part of the eye, which had been suspected since the time of Eustachius (1520-1547), was first demonstrated microscopically, in 1835, by an American, William Clay Wallace of New York, who revived the name *ciliary muscle* which Eustachius had given to it (*Am J'l. of Sciences and Arts*, 1835, XXVII, 219-222). Even the deeper circular fibers were first mentioned by Wallace, altho the honor of their discovery is often credited to H. Müller.

B. ZEISS versus ZEIS.—Some years ago the writer called the attention of Professor Piersol to the fact that the sebaceous follicles lubricating the cilia, belong to Zeis, not Zeiss. Edouard

Zeis, of Dresden, in 1835, in von Ammon's *Zeitschrift für Ophthalmologie*, described these structures. Up to date, all books on anatomy and ophthalmology, with two or three exceptions, perpetuate the misspelling.

C. DOUGLAS ARGYLL ROBERTSON (1837-1909).—Argyll-Robertson, so far as can be ascertained, never lived. He is a myth. The pupillary sign, which is found so frequently in tabes, should be called, "the Robertson symptom." The hyphen is out of place.

D. SAEMISCH'S INCISION, which is mentioned in all ophthalmic text-books as of value in the treatment of *ulcus serpens*, was described, practiced, and published by G. J. Guthrie, in 1843—twenty-seven years before Saemisch wrote on the subject.

E. GALEZOWSKI REDIVIVUS.—The iris knife to which our instrument makers attach Dean's name, is described on page 443, and is pictured on page 444, of Galezowski's *Traité des maladies des yeux*, troisième édition, Paris, 1888.

F. IRIDOTASIS—BORTHEN, OR CRITCHETT.—Iris-inclusion operations for glaucoma, regardless of the danger of causing sympathetic ophthalmitis, seem to be attaining popularity. Except as concerns minor details, the writer fails to find wherein the procedure of Borthen (1909) differs from the operation which George Critchett, in 1857, performed in four cases of acute glaucoma. (*Royal London Ophthalmic Hospital Reports*, vol. 1.)

G. CORNEO-SCLERAL TREPHINING FOR GLAUCOMA.—While his admirers attribute this procedure to Lieutenant-Colonel Elliot, doubtless that gentleman, if he could be heard, would give a different version of the origin of the operation.

Argyll Robertson—without the hyphen—in 1876, took Bowman's corneal trephine, added a roughened handle and a guard to limit its penetration, and trephined the sclera; later, he made a conjunctival flap and moved the instrument forward, so as to engage the corneo-sclera; and predicted, that the operation would give "an effectual means of reducing intra-ocular tension." (*Royal London Ophthalmic Hospital Reports*, vol. VIII, part 3, May, 1876.)

H. USE OF THE CAUTERY IN ULCERS OF THE CORNEA.—The surgeons of ancient and medieval days applied the cautery to all sorts of diseases. The use of the actual cautery in infected ulcers of the cornea belongs, not, as often has been stated, to Gayet of Lyons, but to our own Martinache, of San Francisco (*Pacific Medical and Surgical Journal*, November, 1873).

In his work on *Ophthalmic Surgery*, the late Charles H. Beard, of Chicago, said:

"Since the year 1873, when Martinache, of San Francisco, first called attention to its virtues in the treatment of *ulcers of the cornea*, the cautery has come to be a standard remedy for all such infectious diseases as serpent, fascicular, annular, dendritic and rodent ulcers, ulcerated wounds, and the ulceration incident to purulent ophthalmia."

I. ENUCLEATION OF THE EYEBALL.—The modern method of enucleating the eyeball, whereby there shall be the least sacrifice of other tissues without disturbance of Tenon's capsule, is credited by various ophthalmic writers to Bonnet, of Lyons, and to "Ferrall," of Dublin. As a matter of fact, the credit belongs to the Irishman, J. M. O'Ferrall (*Dublin Medical Journal*, 1841.).

J. CYCLICOTOMY.—At almost regular periods we are asked to consider a "new" operation for glaucoma, whereby the ciliary muscle is severed along with more or less adjacent tissue. Henry Hancock (1809-1880), in 1860, wrote "On the division of the ciliary muscle in glaucoma," and covered the subject thoroly.

K. PARACENTESIS IN CORNEAL ULCER.—In 1904, in advocating paracentesis of the cornea in cases of ulcer in which perforation seemed to be imminent, the writer said:

"If paracentesis is indicated in corneal ulcer, the opening should be made not thru the floor of the ulcer, as is usually advised, but, with care, a paracentesis can usually be made thru normal tissue, and infection should not follow." (*Modern Ophthalmology*, page 355).

Only recently did the writer learn that precisely the same advice had been given by Alfred von Graefe, in 1872.



**L. SUCTION OPERATIONS FOR CATARACT.**—The intracapsular extraction of cataract by means of a suction apparatus is now in the limelight; and not infrequently is credited to Barraquer, an eminent ophthalmic surgeon of Barcelona. While Barraquer has greatly improved the suction apparatus, and has employed it in more than one thousand extractions, the method belongs to an American. In 1910, Dr. Vard H. Hulen, then of Houston, Texas, now of San Francisco, reported six successful intracapsular extractions by the suction method (*Ophthalmic Record*, December, 1910). Barraquer published his first paper on this subject in 1917. It is to be hoped that the suction operation will not have to be thrown into the discard, because of loss of vitreous humor and detachment of the retina.

**M. HYPEROPIA VERSUS HYPERMETROPIA.**—Perhaps it is unnecessary to state that *hyperopia* (oversight), which seems to be firmly entrenched in our literature, is a less expressive word than *hypermetropia* (over-measure-of-sight); and that *chorioid* should be preferred to *choroid*. The dislocability of the English language is astounding.

Many other examples, like those which have been mentioned, might be cited of the errors which have crept into the literature of ophthalmology. However, it is not the writer's desire, to compile a complete list of "errors;" but, to command the attention of the reader, so that more careful study may be given to the preparation of the ophthalmic literature of the future.

In many respects we Americans are like the ancient Athenians whom Pericles addressed; and whose fateful Peloponnesian War was described, in masterful language, by Thucydides. We are new; often we are erratic; we are easily changed from positivism to nega-

tion; we are unduly sensitive; and most of us take ourselves too seriously. Doubtless we will improve with age. However, in spite of our defects, we still remain the one best hope of the world. Let us so conduct ourselves as to deserve the high position which the fortunes of war have cast in our direction.

In place of wildly striving to produce some modification in an operative procedure to which our names may be attached, the most of us might better serve our profession by a careful study of the writings of such dead giants as Donders, Snellen, Bowman, Helmholtz, Hutchinson, Liebreich, Bader, Hancock, Panas, Galezowski, Mackenzie, Critchett, and many others. One of the serious errors in our present-day ophthalmic literature is the ignorance, which many writers display, of the work which was done by those who have passed. Many hours would be saved, much useless experimentation would not be undertaken, and not a few hopes which are foreordained to end in bitter disappointment would be avoided, if the present generation only were wise enough to learn the history of the profession.

One of the pathetic things of life is this: that it seems to be impossible for the son to take up the burden at the point where the father, in the weariness of years, has laid it down. If the work of the masters were known, we would hear less of new operations and new discoveries.

The writer will now bring this paper to a close, by quoting what Elliot said five years ago, *in re* glaucoma:

"Those who have read, or who will read, patiently what von Graefe, de Wecker, Bowman, and many another giant of the past had to say on the clinical side of the subject, are bound to rise from their task in a chastened and humble frame of mind." (*Ophthalmoscope*, 1916, page 510).

## EYE GLASSES VERSUS SPECTACLES.

FRANK G. MURPHY, M.D.

MASON CITY, IOWA.

It is here argued, that with care to have them well fitted and kept in proper position, eye glass frames may be used with the same advantage as spectacles. If not kept in proper shape either will give unsatisfactory results.

Dr. Geo. M. Gould's article in American Medicine on eyestrain is in many respects timely. His warning that glasses should be kept polished, and that lenses prescribed for the relief of eyestrain should not be ordered in frames where there is danger that the lenses will not remain correctly placed, is logical. Indeed no competent oculist would prescribe eye glasses for a patient whose occupation exposes him to strong currents of air, or for one whose nose is not properly shaped to hold them securely, no matter what his occupation might be.

However, his denunciation of all eye glasses is too sweeping, for while there are many who, because of their vocation or shape of nose, should not wear them, there are thousands who can and do wear them and with greater comfort than spectacles. It is by no means true that spectacles always hold lenses before the eyes better than eye glasses do. Let anyone for a day observe the disarranged eye glasses and spectacles worn by those he chances to meet and it will be unusual if he does not see more spectacles with one glass cocked higher than the other, than eye glasses improperly worn.

There are reasons why eye glasses on many stay in place better than spectacles do. The frame of an eye glass will give and become displaced on the nose when accidentally struck, and is not as easily bent as the spectacle frame. Eye glasses need only to be replaced on the nose but the adjustment of the bent spectacle frame is not so easily dealt with; and they may be worn for months with or without the patient's knowledge, and in any event the finding of an operator who will skillfully adjust them is a matter of more or less inconvenience. Any attempt the wearer may make to remedy his mishap will

invariably result in its being made worse than before.

There are those who could wear eye glasses as well as spectacles but because of their sensitiveness to the pressure on the sides of the nose, will not wear them, and a like condition is found among many who should wear spectacles. They are made so uncomfortable by the temples that hook over the ears that they refuse to be so annoyed when an eye glass could be comfortably worn.

Eye glasses are more easily put on and off than are spectacles, which is important to those who must remove their glasses frequently. From the former a chain may be attached to the clothing, but spectacles must be carried in a case, which is inconvenient, especially for women.

In this northern part of the country, during the winter months, the cold lenses immediately steam over when a warm room is entered, which necessitates their removal, and for this both hands are usually used, which also is a disadvantage. This occurs at a most inconvenient time and is particularly embarrassing to women who must disarrange their hair by the process. This trouble with spectacles would not be of great importance if this procedure were necessary to preserve the eyesight and health, and would be more gracefully endured if the sweeping condemnation of the eye glass as made by Dr. Gould were justified.

The many eminent oculists who wear eye glasses themselves and who prescribe them for their patients is evidence that they do not subscribe to the severe indictment of the eye glass. Dr. Gould's high standing and long and useful service to the medical world gives importance to any words his hand may pen, tho we presume he lays no

claim to infallibility. It is my opinion that many will be unnecessarily inconvenienced by his expressed prejudice against the eye glass, and that his opinion should not go unchallenged.

ably by many where spherical lenses are prescribed. The manufacturers of eye glass mountings have for years been vying with one another to overcome all possible objections to them,



Fig. 1. Correctly adjusted modern eye glass, comfortable and stays in place.



Fig. 2. Spectacles as they should not be but frequently are worn.

His criticism would be timely were we using the make of eye glass frame manufactured fifteen and twenty years ago. But those in common use today are made with stiff guards which hold the lenses firmly in place and their use is of great comfort to thousands. Even the hoop spring is worn comfort-

and they have succeeded in a remarkable degree.

Dr. Gould's warning voice has the earnest ring of the sacred prophets but has a grave sepulchral tone; it tells us of a grievous fault of yesterday, of a danger that is largely past and is not our own.

## GLIOMA OF THE RETINA.

M. J. KEYS, M.D.

VICTORIA, B. C., CANADA.

This is the report of a case which is made the basis of a general review of the subject. Read before the Pacific Coast Oto-Ophthalmological Society, Seattle, July, 1921.

True glioma of the retina is seen so rarely and the subject is so interesting, that it warrants publication of the details of every case observed.

The following case recently occurred in my own practice:

### CASE HISTORY.

J. D., female, was born in the Jubilee Hospital, Victoria, two and a half years ago. She is the only child in the family. Mother pregnant but once. Parents: father, English; his mother was Scotch. The mother of the child is English, born in Lancashire; no history of any similar eye trouble on either side of the house. The little patient when born was a healthy baby, labor was normal, and she has never had a day's illness in her life, not even the diseases common to childhood, and when first seen by me September 28th, 1920, was a well nourished, healthy appearing child.

About two weeks previously, a lady, one of the neighbors, drew the attention of the mother to the peculiar appearance of the child's right eye, and about the same time the child's cousin, a lad of 12 years of age, noticed the same thing, and curiously enough, remarked that it looked like a "cat's eye in the dark." The parents then began to study the eye and noticed in looking at this eye from the temporal side, that it had a peculiar white appearance in its interior. On September 28th, the child was brought to my office for examination, with the history as given above.

*Examination.* Tension of the right eye increased, lids and conjunctiva normal, cornea clear, no signs of posterior synechia or cyclitis or keratitis punctata, the pupil slightly dilated and fixed. In looking at the eye from the temporal side, the white appearance of the interior was quite apparent. The pupil was further dilated with homatropin and cocain, and the ophthalmo-

scopic examination revealed the media clear, but a tumor mass could be seen springing from the lower nasal side of the fundus and projecting forward. No blood vessels were apparent on the growth, which presented an appearance very like absorbent cotton. The temporal side of the retina had the usual red reflex, but towards the growth this diminished, and approaching the growth the reflex was lost. No effort was made to test the vision in this eye. Vision in the left eye normal and has remained so.

*Diagnosis.* I concluded from the history and examination, particularly the absence of any trauma or sickness of any kind, that I had to deal with a glioma, keeping in mind the possibility of a pseudoglioma. I explained the seriousness of the condition to the mother and advised immediate enucleation. Dr. Scott-Moncrieff of the city of Victoria, saw the case and agreed with the diagnosis and concurred in the treatment. The parents consented at once to the removal of the eye.

*Operation.* On September 30th, the eye was removed in the usual way with this exception: after the muscles were severed, the optic nerve was grasped with curved artery forceps and cut between the forceps and the eyeball. The nerve was then put on the stretch and cut behind the artery forceps. This portion of the nerve, with the eye, was sent to the pathologist for examination. The eye was noticeably enlarged, as it was difficult to get it thru the palpebral fissure after its separation. The wound in the conjunctiva healed without incident.

*Pathologist's report.* "The retina is completely detached in this specimen and almost completely involved. Only a very small portion can be recognized as retina. The optic disc is involved. While the sclera does not appear to be involved in this particular section, there

is extraocular extension of the growth between the loose tissue about the ball.

*Diagnosis:* Glioma exophytum.

*Subsequent History.* After receiving the pathologist's report to the effect that the growth was gliomatous, I advised the parents to have the orbit exenterated, but they refused, saying that they would rather lose the child than have this deformity, so at the end of

decided to have the second operation done. On December 17th, the orbit was exenterated and the pathologist's report was to the effect that the growth was gliomatous.

On December 23rd, January 3rd, 7th, 14th, 21st, and February 12th, 20 milligrams of radium were placed between the lids and left there in each instance about five hours. But the growth again



Fig. 1.

Fig. 2.

Fig. 3.

Showing appearance of recurrent tumors June 11, 1921. 1, from the right; 2, front view; 3, from left side.

two weeks an artificial eye was inserted, and as the parents lived twelve miles from town the child was seen only occasionally. Two months after enucleation the mother brought the child again to the office, stating that they had noticed that the artificial eye was being displaced inwards.

Examination revealed a tumor mass, soft in consistency, about the size of a small marble, under the conjunctiva, situated slightly to the temporal side. I explained to the parents that the growth had recurred and advised as a last resort the exenteration of the orbit and the use of radium, but they again refused, as I could not promise them a complete cure, but they had heard of cures in other cases of malignancy, so two weeks afterwards they

showed symptoms of recurrence and the use of radium was abandoned.

The growth gradually increased in size. The child was seen from time to time and the growth kept gradually increasing. The child has slowly lost in weight, has lost her appetite and is irritable, sleeps badly, mostly under the influence of paregoric, but her mental condition has remained good. On June 11th photographs were taken as shown, and it will be noticed that there is a large tumor mass originating in the eye socket and protruding forward, looking very much like a truncated horn. The surfaces are fungating and bleed very readily and the whole mass emits a sickening, musty odor. The nose is forced to the left and is almost covered by the tumor mass. The right nares is



closed, so that the secretions find their way backwards into the naso-pharynx and thence into the throat.

The photograph also shows a large smooth tumor mass situated on the right lower jaw, at first bluish in color due to venous stasis. The surface is also smooth and glistening. This tumor extends to the right clavicle, below and well beyond the middle line in front. Behind, it extends beyond the middle line and as high as the occiput. Above, it extends almost to the top of the ear. The lower pendulous portion is soft and fluctuating, evidently containing pus. Superimposed upon this mass is another smaller fluctuating tumor about the size of a hen's egg, located at the site of the preauricular gland. There is another tumor mass about the size of a walnut at the post-parietal area in the midline. On the left side, the submaxillary glands are enlarged and the whole chain of cervical glands are palpable as far down as the clavicle. No glandular enlargement below the clavicle on either side. In the sulcus between the fungating mass and the tumor mass of the jaw, pus is exuding posteriorly.

July 6th: The horn like mass above described has enlarged in size to such an extent that the child's nose is buried under the growth and extends beyond the middle line, obscuring the vision of the left eye. That portion of the supermaxilla on right side containing the teeth is forced to the left about a quarter to a half inch. The mouth is distorted so that the taking of medicine and nourishment is difficult. The large tumor mass of the right jaw has also enlarged in size, and has increased in venous stasis, and the growth projects beyond the clavicle. The child is now confined to its crib and refuses nourishment. Death will probably take place shortly no doubt from exhaustion.

#### FREQUENCY AND NATURE OF GLIOMA.

The subject of glioma retinae is interesting not only on account of the nature of the tumor, concerning which there is always some difference of opinion, but also on account of its compara-

tive rarity. According to statistics the tumor is observed only once in 10,000 cases ordinarily presented in ophthalmologic practice, so that the average ophthalmologist may not have the opportunity of observing a tumor of this kind in his ordinary practice.

I am deeply indebted to Dr. Paul D. Berrisford of St. Paul, Minn., for his interest in this case and for valuable notes drawn from his article: "Statistical Notes on Glioma Retinae,"<sup>1</sup> in which he brings the cases of glioma in the Moorfields' Hospital, London, practically up to date, and he writes me recently that there has been practically nothing new on glioma since 1916. The cases in Moorfields' Hospital were written from 1871 to 1905 by Lawford and Collins,<sup>2</sup> Marshal,<sup>3</sup> and Owen,<sup>4</sup> and Dr. Berrisford has brought them up to date.

The first accurate and scientific description of the tumor was written by Wardrop<sup>5</sup> in 1809, based on the study of 17 cases. In 1853 Virchow<sup>6</sup> published the result of his exhaustive clinical and pathologic research.

Both Wardrop and Virchow observed the similarity between glioma and the white substance of the brain. The term glioma retinae, due to Virchow, does not seem to be strictly correct. O'Connor<sup>7</sup> remarks that a glance at the literature of gliomatous growths will show manifold variations in those cases in which the retina was entirely obliterated in the tumor mass, and others in which the layer of rods and cones was demonstrated to be clearly free from participation in the pathologic process. The point is fully discussed by Flexner<sup>8</sup>.

Flexner and Wintersteiner<sup>9</sup> contend that the correct nomenclature is *neuroepithelioma*, as the tumors have their origin in the neuroepithelial layer of the retina, but the old term is retained on account of its general use, at the same time being more comprehensive. It is also called sarcoma of the retina and fungus hematodea oculi, a term used by the older authors. Beer<sup>10</sup> called it amaurotic cat's eye. The tumors are subdivided by Hirschberg<sup>11, 12</sup>, according to their location and

direction of growth, into exophytum and endophytum. In glioma exophytum the growth proceeds towards the choroid after the retina has been detached. It finally reaches the choroid and spreads out superficially and may go as far as the anterior chamber, or vessels may grow out from the tumor into the choroid accompanied by tumor cells. In glioma endophytum the growth is attached but loosely to the retina and grows forward into the vitreous, and as a rule the growth completely fills the eye. This form of growth is the more rare.

All are agreed that this neoplasm originates in the granular layers of the retina, and most commonly in the inner granular layer. The tumor is composed of small cells in a very soft basement substance. The cells consist of a definite nucleus surrounded by scanty protoplasm, and in many cases possess processes. The cells follow the blood vessels, and on account of their rapid growth may take the appearance of tubular glands. Some are glia cells and others are ganglion cells. Degeneration in the intercellular substance takes place early.

The cause of glioma is unknown. The disease is one of infancy and childhood, no true cases having been known after the age of sixteen, according to the Moorfields Hospital reports covering 135 cases from birth to seven years of age. The highest percentage was found to occur during the second year of life, gradually increasing from infancy to that age, then receding till there were only two cases in the 135 at the age of seven years. 56 cases, or 41 percent, were first noted before the thirteenth month; 26 cases during the second year—only two cases being reported in the seventh year.

Quoting again from Berrisford's report at Moorfields Hospital: Between the years 1871 and 1913, covering 42 years, the total number of out patients numbered 1,259,452. Out of this number there occurred 131 cases of glioma retinae, or roughly, 1 in 9600 cases, or .01%. Other authors have about the same percentages.

Males and females are affected about

equally, with the balance slightly in favor of males. In 792 cases collected from many different sources, there were 398 males, 361 females, and 33 cases in which the sex was not stated.

In 25% of cases, both eyes were affected, the disease originating in the second eye independently of the first, and not passing by continuity thru the chiasma.

Wintersteiner in his work gives an interesting report as to the relative frequency with which the various parts of the body become involved in the metastatic process. I quote:

Brain and Membranes, 43 times,  
Skull and Bones of the Face, 40 times,  
Lymphatic Glands, 36 times,  
Parotid Gland, 9 times,  
Skeleton Bones, 9 times,  
Liver, 7 times,  
Spinal Cord and Membranes, 5 times,  
Kidneys, 2,  
Ovaries, 2,  
Lungs, 1,  
Spleen, 1.

It is interesting to note in the case reported that the bones of the face were affected, also lymphatics and parotid gland, but the brain was apparently not involved. The probable reason for this will be given later.

Professor Fuchs says that a congenital morbid disposition or, as he aptly puts it, "a congenital vice of development," very often lies at the bottom of glioma, and he says that often it is observed at such an early age that the beginning must be dated back to fetal life. This prenatal origin calls to mind a statement of Treacher Collins: "That a microscopic specimen of a fetal retina at three months with layers undifferentiated, is such that if shown to a pathologist it would be pronounced by him as glioma."

That the disease runs in families is beyond doubt. Many striking cases are on record. The following reported by Berrisford will suffice:

The Grover family is very interesting. Thomas Grover was operated on in 1859 when five months old, the left eye being removed for glioma. He survived and had a family of two chil-

dren. The son, Frank, had his eye removed at three years and died at the age of fifteen from paralysis. The daughter's, Beatrice Wallbank, first three children all died at four years with glioma, two of them having bilateral glioma. The next four children were all healthy, but the eighth—the last child, died at three years from double glioma. Professor Fuchs records a case in his text book in which a child of four years died of brain symptoms following removal of a gliomatous eye. Later on the brother, aged 2, was found to have the same trouble in an eye blind from birth, and died from double glioma. A third child was suspected of having glioma, but the trouble proved to be coloboma of iris and choroid. Newton reports a case where ten out of sixteen in the same family died with glioma.

*Glioma in a Shrunken Eye.* The presence of glioma in a shrunken eye is a rare condition; only about twenty cases are recorded in all literature. Dr. Denis O'Connor<sup>7</sup> of Worcester, Mass., records a very interesting case in an infant, in which the shrunken right eye was removed and was found to be gliomatous. The child died later on from glioma of the left eye without recurrence in the right. His conclusions are to the effect, that after destruction of the retina the necrosis progressed, the necrotic masses being replaced by connective tissue which in turn is invaded; and the cycle is repeated until finally the eye becomes quiescent, having undergone necrosis and calcification, thru as he thinks, insufficient blood supply. But he further states that some of these cases finally die of recurrences, and he records many of these cases as pseudogliomata or as an episode in the course of true glioma preparatory to further advance. This probably explains the cure by ophthalmologists of one hundred years ago, who resorted only at that time to antiphlogistic, alternative and derivative treatment.

*Differential Diagnosis.* In making differential diagnosis the history of the case, as well as the family history, is important. One must inquire for history of injuries to the eye, and ascer-

tain if the child has had meningitis or other infectious diseases common to childhood, and the signs of iridocyclitis and keratitis punctata must be looked for. The rare diseases, such as:

Acute Suppurative Hyalitis,  
Cysticercus in the Vitreous,  
Retinitis Circinata,

Detachment of the Retina with dropsical degeneration of visual cells, reported by de Schweinitz, must be kept in mind as a possibility. Simple detachment of the retina and leucosarcoma are both rare conditions in childhood. A corneal cicatrization or staphyloma may obstruct the pupillary space, or in the glaucomatous stage of glioma a hyphema or cataract may obscure or prevent ophthalmoscopic examination; or hemorrhage into the vitreous may become organized and render the diagnosis difficult. Persistent vascularity of the lens capsule or hyaloid artery with posterior polar cataract may also lead to a wrong diagnosis. Tubercles of the choroid and chronic inflammatory processes in the choroid and ciliary body are the two conditions that call for careful discrimination, and often a positive diagnosis cannot be made until after the eye is removed. A report from Moorfields Hospital from 1888 to 1893 indicated that seven of twenty-four eyes enucleated for glioma were pseudoglioma. In the case reported all the clinical symptoms were present with one exception—the tumor mass did not show vascularization, which is the rule.

*Recurrences.* The prognosis on the whole is very bad. It is only favorable when operation is done early and when the tumor does not extend beyond the retina. At least three years must elapse after enucleation before we can count on a permanent cure. In the meantime the other eye may become affected, or metastases may take place. We can count on a permanent cure only when the optic nerve is intact and the tumor is confined to the retina. The percentages of recovery given are small. Hirschberg figures on 6.5%; Wintersteiner 13.7%; Vossius 10%. In the Moorfields Hospital report, the percentage of cures is not given on ac-

count of the difficulty of tracing some of the cases, but Berrisford considered 9 out of the 41 cases enumerated by him as cured, more than three years having elapsed since enucleation.

Fuchs in his text book states that 3 cases of glioma have been reported as recovering spontaneously by shriveling. De Kleijn<sup>13</sup> reported 18 cases of glioma retinae operated in Utrecht with eight recoveries. In 4 of these recoveries the optic nerve was free; in 2 the affection was peripheral; in 1 the optic nerve was completely involved as far as the section; in 1 the amount of involvement is not stated. In the case where the optic nerve was involved, the other eye became blind later and had to be removed.

Seventeen cases were reviewed by Hirschberg, of which 10 at the time of operation had not extended beyond the retina, and in none of these latter had a relapse occurred during a period of from 5 to 13 years subsequent to operation.

The radium treatment was carried out in the Department of Radiology and Electro-therapeutics of the Provincial Royal Jubilee Hospital, Victoria, B. C., under the direction of Dr. L. K. Poyntz. Dr. Poyntz thinks that while there are grounds for supporting the view that the more malignant a tumor is the more vulnerable it is to massive radio-

therapy, yet it must be admitted that the rays may stimulate rather than destroy tumor masses. It is possible that radium had a stimulating effect in the present case.

Dr. Poyntz thinks that it is probable that a preparatory irradiation before enucleation, complete fulguration of the contents of the orbit at the time of operation, followed by intense radium treatment of those sites where recurrence is more common, might be a rational treatment of this type of case.

Verhoeff<sup>15</sup> quite recently reported that there were in literature only 2 cases in which an eye containing a glioma retinae was treated by radiation with apparent success. These cases were reported by Hilgartner and Schoenberg. Verhoeff himself reports a case in which, 6 months after enucleation of the right eye for glioma followed immediately by severe X-raying, a tumor developed in the left eye. This was immediately treated by X-rays. This tumor tho it had given rise to intraocular metastases had not invaded the optic nerve. Altho Verhoeff had not the opportunity to verify this tumor histologically, he thinks there can be little doubt but that it was a glioma. Altho it persists yet, the child's vision following the X-ray treatment appears to be perfect for the 3 1/2 years following treatment.

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## GLAUCOMA A CILIARY NEURITIS.

OTTO WIPPER, M.D.

CHICAGO, ILL.

The essential pathology of this condition is held to be neuritic cyclitis from pressure on the ciliary body. Its severity depends on the extent of the inflammatory process. From the ciliary body the disease may extend backward and forward.

In this brief article I wish to present my conception of the actual causes and the essential pathology of glaucoma.

The idea, advanced here, is by no means a new one, but one hears so little of it, that I think it well worth while to be considered. I have made no reference to the different other theories, because they do not seem plausible to me, nor have I referred to other writers.

The actual causes I divide into three groups:

(1.) Lack of development, as we find in the congenital form in which the canal of Schlemm, and perhaps other parts that are concerned in the outflow of lymph, are either absent or incomplete.

(2.) Other ocular conditions, such as tumors, scleritis, iris bombé, etc., bringing on the so-called secondary type.

(3.) Trauma, either accidental, surgical or brought on by anatomic changes.

The latter form in which the trauma results from anatomic changes, is the most frequent; it is also the form that stimulates the keenest speculation.

The anatomic changes consist mainly in the enlargement and the hardening of the crystalline lens, and in a lesser degree in the hypertrophy of the ciliary body in hyperopic eyes.

Before such changes occur the distance from the lens to the ciliary processes is about 0.5 mm., so that the changes need not be great to bring the structures in contact; and gradually the ciliary body will be more and more pressed upon by the lens, the latter acting as a large foreign body. Hence I consider trauma the actual cause.

That after forty years of age most eyes, even the hyperopic, are free from glaucoma, is partly due to the fact that the anatomic changes are less marked,

but principally to their coming on so slowly and so gradually that the structures are able to accommodate themselves to the new condition, while in glaucomatous eyes the changes have progressed much more rapidly.

### THE ESSENTIAL PATHOLOGY.

The result of the constant pressure upon the ciliary body is a cyclitis, which is of a neuritic character; in other words, a ciliary neuritis ensues.

The severity of the case depends on the extent of the inflammatory process. From the ciliary plexus or plexuses, it may travel posteriorly along the ciliary nerves, and anteriorly along the branches which go to form the corneal plexuses.

In the milder cases, referred to as simple glaucoma, the ciliary body only is affected. In other cases that are usually also termed simple, the inflammation spreads posteriorly. The subjective symptoms may be rather mild in such cases, but whenever the process reaches the region around the optic nerve head, it will lead to more or less optic atrophy.

The ring that is formed around the optic nerve by the ciliary nerves and the posterior ciliary arteries, as they pass thru the sclera, is about 6 mm. in diameter, so that the ten to twelve nerve branches are only about 1.5 mm. apart; the inflammation then extends to the sclera and the vascular tissue. This leads to a degeneration and elimination of the delicate branches of the circle of Zinn, thus depriving the nerve head of nutrition.

The soft elastic tissue of the lamina cribrosa is the first to undergo atrophy, and other tissues follow. The process of degeneration approaching the nerve head from the periphery and affecting the tissues first that are in the plane of the lamina cribrosa, accounts for



the characteristic shelving and depth of the glaucomatous cup.

It goes without saying that increased tension must have influence in intensifying the atrophy and cupping, but I doubt very much that it is the etiologic factor; for if a bulging depended entirely on the tension, it would more likely be as we see it in high myopia, or following scleritis, not to forget the staphylomata that complicate glaucoma itself.

On the other hand it would be difficult to explain the atrophy and cupping occurring in simple glaucoma, in which the tension is only slightly increased, and in some cases not at all.

In the severe forms of glaucoma, called inflammatory and congestive, the process has traveled forward. About thirty-six nerve branches extend from the ciliary body thru the pectinate ligament into the cornea. These branches are at the limbus nearly 1 mm. apart, so that their swelling will readily obstruct the flow of lymph into the canal of Schlemm. The other lymph passages seem to be unable to compensate for this deficiency. I do not believe that any lymph escapes along the bundles of the optic nerve; otherwise we could hardly expect an increased tension preceding the atrophy; everything indicates that the drainage from all the chambers is by way of the canal of Schlemm and the crypts of the iris. I even think that the lymph from the perivascular spaces of the retina travels anteriorly after reaching the disc.

If we consider glaucoma a ciliary neuritis, then there must be an increased inflow from the beginning. We may, therefore, expect a plus tension, even if the outflow is as yet not interfered with.

Any increase in tension will tend to dilate the pupil and also tend to bring

the ciliary body, the iris and the lens forward, thus aggravating the conditions by obstructing the filtration angle still more, and by eliminating the crypts of the iris.

To understand the forward displacement, we have to first consider the attachments of these structures; the most important one is by the pectinate ligament, which is firmly united with the sclera; it is situated anteriorly, extending 4 mm. from the limbus to where the suprachoroidal space begins. The other attachment is posteriorly into the choroid; it blends loosely into the latter and is very narrow radially.

The hydrostatic pressure within the three lymph spaces, aqueous, vitreous and suprachoroidal, tends to equalize and works upon the other structures until they attain the same pressure. By so doing the delicate structures of the ciliary body and the iris can only be compressed towards their firm attachment, the pectinate ligament, which is anterior, and also peripherally to the iris.

When the forward displacement does not occur, in spite of increased tension, I take it that the anterior portion of the suprachoroidal space is obliterated and that the annulus ciliaris adheres firmly to the sclera.

In conclusion I wish to say that I consider glaucoma:

1. A ciliary neuritis.
2. That it is inflammatory from the beginning.
3. That the inflow of fluids is increased from the beginning.
4. That with but few exceptions trauma, brought on by anatomic changes, is the actual cause.
5. That the optic nerve atrophy and the cupping are mainly the result of the inflammatory process and only to a lesser degree due to increased tension.

# NOTES, CASES AND INSTRUMENTS

## BILATERAL PERSISTENT PUPILLARY MEMBRANES.

GEORGE N. BRAZEAU, M.D., F.A.C.S.  
MILWAUKEE, WIS.

These two illustrations graphically depict the congenital condition known as persistent pupillary membranes.

They are vestiges of a membrane that normally disappears about the seventh month of fetal life. On closely examining the illustrations, we see that the membranes present one or more ir-

is grayish brown and the outer half is distinctly brown. Modern embryologic researches proved that these membranes are a part of the vascular sac of the lens alimented by the hyaloid artery. They are also supposed to be nourished thru their arcades from the irides, the posterior part of the lens receiving its nourishment from the artery of Cloquet. From these circumstances, these membranes may deviate from the supposed normal independently of the circulation in the lens or inversely. The irido-capsular



Fig. 1. Bilateral persistent pupillary membrane (Brazeau's case).

regular openings in their centers, from which radiate narrow prolongations of the color of the irides. They are presumed to be remnants of blood vessels that have become covered by elastic connective tissue, in which pigment has been deposited. These projections are attached about the periphery of the pupils in the iris substance, and in no way interfere with their functioning. The irides, as the French would say, are bombés and the anterior chambers are consequently shallow. The trellis work of these membranes stands about one-half millimeter anterior to the irides, as tho it was supported by so many legs. Several fine fibers attach the posterior surfaces of the irides to the anterior capsule of the lenses. There is a central opacity of the right lens. Dilation of the pupils with atropin is normal. The vision in both eyes is 20/40. The inner half of each iris

adhesions are readily distinguishable from those due to inflammation by their elasticity, allowing free movement to the irides. These pupillary bridges are for the most part seen in only one eye; here both eyes are similarly affected.

Their form, size, and consistency may vary, not only with the individual, but in each eye as shown in the illustrations.

These membranes do not cause any functional troubles. The pupil in the left eye resembles one in which an iridectomy was done, leaving the pupillary margin of the iris intact. There is no polyopia. The treatment consists in tearing an opening in the membrane whenever it completely occludes the pupillary opening. In this case it is advisable to let the condition alone. The patient was seen in consultation with Dr. Fowzer.

## GONORRHEAL OPHTHALMIA IN A CHILD OF TWO YEARS.

JOHN A. McCaw, M.D.,

DENVER, COLO.

A girl two years of age was admitted to the Denver City and County Hospital with an infection of both eyes. The eyelids were chemotic and closed. A thick creamy pus was being exuded from eyes. The clinical appearances were those of ophthalmia neonatorum. The laboratory report stated the infecting organism was a gram negative, intracellular diplococcus.

When the child was admitted, the chief resident interne ordered that the eyes be cleansed with warm boric solution every two hours, and constant application of cold compresses. A 25% solution of argyrol freshly prepared daily, was instilled in the eyes every two hours. Six days after the child was admitted, I saw the patient for the first time. The eyelids of both eyes were edematous and closed and there was a fairly profuse discharge from the eyes. I did not succeed in getting a view of the cornea.

In addition to the treatment that was being given we suggested that a 5% silver nitrat solution be applied once to the everted lids. After five days, there being no decided change in the condition, I stopped the argyrol and prescribed mercurochrom 1%, four times daily. Four days later the discharge was still profuse tho thinner and more watery. Smears taken at this time showed a gram negative intracellular diplococcus characteristic of gonococcus, but with less mucus in the smear.

The laboratory report notwithstanding, I felt that we must be dealing with a mixed infection; so I ordered the mercurochrom discontinued and prescribed zinc sulphat grs. 2, boric acid grs. 5, tr. of opium, dram 1, to aqua destillata fl. ounce 1. Two drops in each eye every two hours. The irrigation and cold compresses were continued.

In forty-eight hours the discharge was completely checked and the child had both eyes open and in another day the eyes appeared perfectly normal and

the patient was discharged. The tr. of opium added to this prescription, has a mild astringent as well as anodyne effect, and increases the tolerance for the zinc sulphat in this strength.

## CORNEAL ULCER FOLLOWING APPLICATION OF TONOMETER.

WALTER J. GILBERT, M.D.,

CALAIS, MAINE.

The June number of Ophthalmic Literature, quoting from Elliot's address before the British Society, states that great care should be exercised in using the tonometer, as complications may arise from traumatizing the corneal epithelium.

Within a short time the writer has had an experience demonstrating that the above advice is not wholly theoretic. Mr. J. H., age 76, a patient in Chipman Memorial Hospital, St. Stephen, N. B., while convalescing from a prostaticectomy complained of failing vision extending over a period of one year. The attending surgeon, Dr. W. H. Bunker of Calais immediately referred the case. An ophthalmic examination revealed chronic noninflammatory glaucoma. In using the tonometer the following technic was carried out. Irrigations with warm saturated solution boric acid, 4% protargol and holocain for anesthesia. The piston of the foot plate was cleaned with alcohol, then sterile water and petrolatum. After readings, bichlorid ointment was instilled between the lids.

As the patient was a high strung, nervous man, a protective bandage was applied. Examination was made at eight A. M. The following day, the nurse had charted "patient complains of pain and discomfort in right eye." At nine A. M., or twenty-four hours after examination, the eye had well marked subjective symptoms of ulceration, and in forty-eight hours there was no question as to the condition we had to deal with. The treatment consisted in cauterizing the area, outlined by fluorescein solution, fomentations and frequent instillations of mercurochrome 1%. Both eyes were kept bandaged

during the intervals between treatments and the patient made a good recovery.

One of my colleagues suggested an impending ulceration before examination, but there were no symptoms to substantiate this. It would be well to state that the same morning two other patients had tonometric readings, but not the slightest complication arose from examination of these patients.

The object of reporting this case is to emphasize the importance of Elliot's suggestion: That is, keeping old people under observation for at least twenty-four hours after tonometry.

### DETACHMENT OF THE RETINA FOLLOWING INTRACAPSULAR CATARACT EXTRACTION.

WALLACE RALSTON, M.D., F.A.C.S.,

and

E. L. GOAR, A.B., M.D.,

HOUSTON, TEXAS.

The following case is reported for the reason that, judging from the literature and from conversations with advocates of the Smith-Indian operation, it is a very unusual sequela. In a recent conversation with one of the leading American exponents of this method, we were informed that he had never seen this unfortunate complication.

J. F., age 71, retired merchant. Had lens extracted from right eye two years ago. With correction vision right eye 20/50, left eye light projection perfect. Has a slight secondary in right eye, in the left a mature cataract. Well nourished man. Has moderate degree of pyorrhea. Urinalysis was negative. Teeth and gums were put in good condition by dentist. May 18, 1921, cataract extraction was done on left eye by the Smith-Indian method. No undue pressure on cornea was necessary for expression. There was no loss of vitreous and operation was uneventful. Dressed first on 7th day. There was very little injection. The pillars of the coloboma were free. Anterior chamber had not formed and iris was in apposi-

tion to posterior surface of the cornea. On the 9th day there was still no anterior chamber. A grayish mass was noted forward on the temporal side, easily visible by oblique illumination and having the typical appearance of a retinal detachment. Three days later the same condition appeared on the nasal side. June 4th, sixteen days after operation, the gibbous protrusion appeared above and below, forming four distinct projections. The eye was still soft, very little injected and there was no anterior chamber. The first evidence of the reforming of the anterior chamber occurred June 11th, twenty-three days after operation. By June 20th the detachment had disappeared above and below and was less marked laterally and mesially. The anterior chamber remained shallow and the tension low until about July 5th, tho there was no evidence of detachment seen on June 25th. On July 11th there was a good anterior chamber, very little injection, and the tension was normal by palpation. Some small retinal hemorrhages were visible with the ophthalmoscope and the fact that one of these was in the macular region may explain why this patient's vision was never better than 20/100 with correction.

It is worthy of note that altho the prolonged absence of the anterior chamber pointed to a choroidal detachment, the protrusions had the typical form and color of detachment of the retina. Also that aside from a few vertical striae which rapidly disappeared, the cornea was apparently uninjured by its prolonged apposition to the iris.

### AMULETS FOR THE CURE OF DISEASES OF THE EYES.

HARRY FRIEDENWALD, M.D.,

BALTIMORE, MD.

Amulets played a leading part in the treatment of disease, in ancient and in medieval times. "Over vast regions of the earth to-day, magic amulets, charms, incantations are the chief weapons of defense against a malignant Nature." (Osler.)

The eye has enjoyed special favor, and



as late as 1583, Bartisch in his work on diseases of the eye, *Augendienst*, devoted a chapter to the evil effects of witchcraft



Fig. 1. Arab amulet worn in front of an inflamed eye. Made up of old Turkish silver coin and polished piece of sardonyx, suspended on a red cord. Size of original.

on the eye and the benefit of amulets (Hirschberg, Graefe-Saemisch Handbuch, Vol. XIII, part I, u. 351).

In the Orient where ophthalmias are

common, in spite of the common application of pigments for the eye, the use of special amulets for their relief is often met with (Medical Pickwick, March 1921). They are made of beads or precious stones, which together with an old silver coin, are attached by a red silk cord to some strands of hair, above the forehead or to the cap and thus hang down in front of the inflamed eye. In Palestine they are called *char-aset el-bazle*. To be effective it is considered necessary that a piece of garlic be attached (Dr. Canaan's Aberglaube und Volksmedizin im Lande der Bibel, Hamburg 1914, p. 126). The writer obtained an amulet of this kind from an Arab boy, who came for treatment to an eye hospital in Jerusalem. It is pictured in the accompanying illustration.

Truth may be stranger than fiction, but for vitality and longevity, the latter often has the advantage. Those interested in the subject will find a comprehensive account in the two volumes by Dr. Seligmann, an oculist in Hamburg, entitled "Der boese Blick." 1910.

## SOCIETY PROCEEDINGS

Reports for this department should be sent at the earliest date practicable to Dr. Harry S. Gradle, 22 E. Washington St., Chicago, Illinois. These reports should present briefly the important scientific papers and discussions.

### ROYAL SOCIETY OF MEDICINE, LONDON.

#### Section on Ophthalmology.

Friday, February 10th, 1922, the President of the Section, DR. JAMES TAYLOR, occupying the chair.

#### Symmetric Macular Disease.

MR. FRANK JULER showed a youth with symmetric disease of the maculae. The changes were quite superficial in the retina, not in the choroid. The youth was sent up by his employers in a rubber factory to find out whether anything could be done for him, and also to ascertain whether the condition had any connection with his occupation. He had been at the factory three years, his eye condition having appeared just before he started there. It was ascertained that the lad's work did not bring him into contact with the

fumes given off in the manufacture; and Mr. Juler did not think there was any relationship of the condition to the employment. From the appearances it might possibly be a case of familial disease, such as Dr. Batten pointed out in association with cerebral degeneration; but this lad was quite bright and alert, and seemed to have done well at school.

An elder brother of the patient was affected somewhat similarly, and he had been seen by Mr. Burdon-Cooper, of Bath, in 1915, when he was 21 years of age. Vision was 3/60 in each eye, and there was central choroiditis. He was given some mercurial ointment for inunction, and he was seen again in 1919, when the vision was much worse, and the Wassermann reaction had been positive on two tests. Some members of other branches of the present pa-



tient's family seemed to be affected by a similar condition. Another possibility was that this condition was inflammatory. But the boy appeared to be healthy, his Wassermann was negative, and it had remained so even under a provocative dose of novarsenobillon. Von Pirquet was negative; the only feature out of the ordinary which was discernible was the presence of some septic crypts in the tonsils.

#### **Plastic Operation for Lid Deformity.**

MR. OLIVER showed a patient on whom a plastic series was being done, with the object of making a passable eyelid. The subject was a man who was wounded in 1916. When he came to the exhibitor two months ago he had had a number of operations. When he saw the man, the condition was that the whole of the skin of the upper lid was pulled up and was adherent to the upper orbital margin. The cornea was exposed, and there had been severe corneal ulceration, which had left a nebula. He first excised all the scar tissue, and he thought that in all plastic operations it was most important to replace tissue in its normal situation. The tissues of the lid which were left could then be replaced, with some of the lashes. That left a large bare surface to be covered up, and it was covered by a temporal flap, in which flap it was very important to include the superficial temporal artery. All that now remained was to remove the whole pedicle. The operation was Major Gillies', and he had found it a most useful one.

#### **Cholesterin Crystals in the Cornea.**

MR. R. AFFLECK GREEVES showed, as a curiosity, a patient with cholesterin crystals in the cornea; he had not seen or heard of such a case before. Cholesterin was common in other parts of the eye: in the retina and vitreous, and sometimes in the anterior chamber and lens. This patient had had extensive chronic ulceration of the cornea, with much photophobia and pain. There was found to be chronic disease of the antrum. After that had been treated, the ulceration cleared up a good deal and healed over. There were still attacks

of pain and photophobia, but without ulceration. The patch of cholesterin had gradually increased in size for a year, and now there were also two smaller patches. The cholesterin probably resulted from the splitting up of the protein molecule, and, apparently, it could arise from the degeneration of blood, or from degeneration of tissues, tho the usual form of degeneration was hyalin, with calcareous deposits.

*Discussion.* MR. M. S. MAYOU referred to one case he had seen of cholesterin in the cornea, that had long-standing interstitial keratitis. There were a number of vessels going up towards the patch, and he thought there had been some hemorrhage from these vessels into the corneal substance, which had given rise to the cholesterin. These deposits were more frequently associated with hemorrhage than with any kind of degeneration.

THE PRESIDENT thought there must be some associated cause not yet determined, otherwise it must occur much more frequently.

MR. GREEVES pointed out, in reply, that with the lessening of the blood vessels the cholesterin patch was getting bigger.

#### **Structures Associated with the Choroidal Fissure.**

MISS I. C. MANN read a paper, supplemented by models and an epidiascopic demonstration, on "The Morphology of Certain Developmental Structures Associated with the Upper End of the Choroidal Fissure." The particular structures she was concerned with were: (1) a small, cone shaped mass of cells in the center of the optic disc in the human embryo of the 10th week and later; (2) the mass of unpigmented cells found just below the optic stalk, on the outside of the eye, in a 6th week human embryo. She wanted to show these structures were produced by a more rapid growth of the inner layer of the optic cup than of the pigment layer.

She had arrived at the conclusion that, from this point of view, the eyes of vertebrates could be divided into those showing an overgrowth of the in-

ner layer, and those which did not show it. In a six weeks human embryo the pigment layer was thicker, and the inner layer was separated from it. She demonstrated a small mass of unpigmented cells which was continuous with the pigment layer, a point to which she attached importance. A section thru the eye of a two day chick showed a greater elaboration of structures connected with closure of the choroidal fissure. There was here a definite overgrowth of the inner layer, that layer being thrown up into folds, and in the region of the fissure the unpigmented inner layer was heaped up on the inner side, forming a ridge, and was everted in the lips of the fissure, where the inner layer became continuous with the pigment layer.

At this stage, in the bird's eye, the upper part of the eye, above the insertion of the stalk, was bigger than the lower part, and the bird's eye grew by extension of the lower part below the insertion of the optic stalk. It was stated that the bird had not a definite hyaloid artery, but in very early stages one could demonstrate a mesoderm containing blood corpuscles, this strand passing across the eye, similar to the hyaloid artery in mammals.

Miss Mann proceeded to show a large number of excellently prepared specimens from different animals and from the human embryo. It had been found that the hyaloid artery got on it a bulbous enlargement as it was passing thru a mass of cells, and it was this budding out which vascularized the mass, and their insinuation among the nerve fiber layer formed definitive branches of the arteria centralis retinae. The small mass of unpigmented cells on the outside of the embryonic eye was the remains of the portion of the inner layer which occasionally became everted in the upper part of the cleft, before it closed. If the eversion took place only at the upper end of the cleft, and no nerve fibers grew into it, as in man, the little mass after a time disappeared.

*Discussion.* DR. LEIGHTON DAVIES spoke of a case he had in which all the retinal vessels appeared at the periphery of the disc, just as in the rabbit's eye.

THE PRESIDENT expressed the congratulations of the Section to Miss Mann for her interesting demonstration, and the beauty of the models and specimens with which she was working.

#### **Choroidal Sarcoma.**

DR. HENRY J. MAY and MR. F. A. WILLIAMSON-NOBLE contributed papers on this subject, Dr. May describing the clinical and operative details, and Mr. Williamson-Noble the pathologic findings. All the three cases were seen by Dr. May within 19 days.

The first patient, a robust man of 60 years of age, complained of failing vision for near work, and discomfort with his glasses during a year. His distant vision was perfect. There was no evidence of inflammation in either eye. The tension in the right eye was a little fuller than in the left; the right pupil was slightly larger than the left, and was sluggish to light; the media were clear. In the fundus, below the outer side of the optic disc, he found a kidney shaped swelling, measuring  $1\frac{1}{2}$  discs one way, one disc the other; on its border were two small retinal hemorrhages. There was evidence of a pushing forward by a solid mass behind. The man had been getting thinner in the last  $4\frac{1}{2}$  months. At that time, he would not consent to the enucleation operation which was urged. Seven months later he returned with an attack of acute glaucoma. The eye was then quite blind, and no view of the fundus could be obtained. Three days later the patient consented to enucleation. Dr. May found a typical mushroom shaped growth, with a broad base, and it occupied the whole macula; the retina was detached. There was no evidence of extension of growth. On section the growth did not seem to have involved the sclerotic coat, and section of the optic nerve showed no sign of growth.

The second was in a man aged 52, very healthy looking. He had a painful red eye, but no trace of iritis. The cornea was bright and clear, and the tension plus 2. The anterior chamber was apparently obliterated, and the iris seemed to be in contact with

Descemet's membrane. An opaque iridescent lens was tilted forward. On enucleating the eye he found a melanotic sarcoma the size of an average pea. As section of the optic nerve showed a suggestion of extension of growth to it, the orbit was exenterated. There were as yet no signs of recurrence.

The third patient was aged 67. He had been unable to see with the right eye for six months. In the right fundus, external to the disc, there seemed to be a large pigmented mass, with folds of retina lying over it or intermingled with it. The edge of the right optic disc was blurred and indistinct. Over four months later the man said his eye was totally blind; the pupil was dilated and inactive. In the fundus could be seen a large mass pushing the contents forward. Tho 5 feet 11 inches in height, this patient weighed only 85 pounds. The eye was enucleated. The growth was a melanotic sarcoma; the optic nerve showed no extension of the growth into it. The patient had since had pains in the chest and abdomen, so there was reason to fear visceral involvement and a downward course.

Dr. May discussed a number of general questions connected with this type of case, and Mr. Williamson-Noble followed with a demonstration of sections of the growth.

H. DICKINSON.

### CHICAGO OPHTHALMOLOGICAL SOCIETY.

February 20, 1922.

DR. FRANK E. BRAWLEY in the Chair.

#### Retinitis Pigmentosa?

DR. MICHAEL GOLDENBURG reported the case of Mrs. L. B., colored, age 38, who stated that she had no eye trouble in youth or at any time until October, 1917, when her left eye was struck by a piece of wood. This eye was enucleated in December, 1917. About three weeks after the accident to the left eye, she began to have severe frontal headaches, marked photophobia; various colors appearing before the right eye. At the time of the accident pa-

tient went unattended, but within five weeks after the accident she required some one to accompany her, not because she was unable to make her way along the streets, but because when she arrived at the doctor's office she had to enter thru a small dark hallway. She was unable to make her way thru this hall, and when she entered the office she was unable to find a chair. Patient cannot give any information as to consanguineous marriages. At the time of enucleation of the left eye, the vision of the right eye was very poor, everything appearing blurred even in the presence of good illumination. About three months after the enucleation, vision in the right eye started to improve and soon she was able to distinguish objects, and to thread a needle under good illumination. There was not much change in vision from this time up to the time of entrance into the hospital.

In the hospital it was found that she had a four plus Wassermann.

On admission she had tubular vision, 20/20. Ophthalmoscopic findings: Disc fairly well defined, small crescent of pigment on temporal side of disc, disc appeared pinkish, lamina cribrosa not visible, shallow physiologic cup. Arteries markedly contracted and straight. Typical bone corpuscle pigment in periphery, anterior to vessels. In several places the pigment follows the vessels in a straight line and anterior to them. Fundus tessellated; no atrophy or arteriosclerosis of choroidal vessels apparent. Perimetry disclosed a contraction to 10 degrees. Refraction: small error, not improved by glasses.

His only object in presenting this case was that he had never seen a case of retinitis pigmentosa in a colored person before and thought it worth while reporting.

*Discussion.* DR. HARRY S. GRADLE asked whether the case might not be one of luetic retino-choroiditis instead of retinitis pigmentosa.

DR. GOLDENBURG replied that the patient was getting a regular course of antisyphilitic treatment. He had seen two cases in which there was some question as to whether it was retinitis

pigmentosa or syphilis. In these cases he found some parts of the field with pigment of a darker character. It did not assume the feathery arrangement seen in retinitis pigmentosa as in this particular case.

DR. GEORGE F. SUKER did not believe there was a case of retinitis pigmentosa reported in the literature where the disease started at the age of this individual. Retinitis pigmentosa began early in life; it might go on for years without manifesting any symptoms to speak of, but eventually there would be symptomatology of one form or another. Vision might remain absolutely normal for years, but sooner or later there would be a dimming and marked contraction of the field of vision. It was not necessary in retinitis pigmentosa to have the pigment symmetrically distributed thruout the periphery of the retina. It may even at first be limited to the nasal or temporal half of the retina for many years, but eventually it will involve the other half also.

In this particular case he thought the element of syphilis was a strong possible feature, and then the case would not be one of true retinitis pigmentosa, but a retinitis syphilitica pigmentosa, pure and simple, giving the same characteristics of poor night vision as in a true retinitis pigmentosa. Furthermore, the pigment spots would later on, or even now, assume the bone corpuscle outlines, the same characteristics as one saw in retinitis pigmentosa. Another difference between this case and retinitis pigmentosa was that this nerve head was not a waxy yellow with an evident neuritis but presented a clear cut optic atrophy picture, as seen secondary to lues. Retinitis pigmentosa was a retinal lesion, pure and simple, while in this case there was already considerable choroidal involvement, much more so than obtained in a classic retinitis pigmentosa. So far as the symptomatology and the visual fields were concerned, they were practically the same in the two diseases, but the pathology was quite different.

DR. ROBERT VON DER HEYDT stated that he had had an opportunity to study this case with the large Gull-

strand binocular ophthalmoscope. The lesions he saw were absolutely confined to the retina and their depth was beautifully shown stereoscopically.

DR. THOMAS FAITH suggested the patient might have had monocular vision before one eye was lost.

DR. GOLDENBURG said the patient did not know her vision was bad until this eye was destroyed. She gave a history of having poor vision in the eye for some time past. He thought there was no question about the case being one of retinitis pigmentosa. In colored people the nerve head could not show up as typically as in a Caucasian. This was due to contrast. The proliferation of the pigmented epithelium in retinitis pigmentosa was secondary to atrophy of the choriocapillaris and destruction of the tissues anterior to this layer. The proliferation took place around the equator and as the condition progressed, it extended on toward the nerve head. In a syphilitic case one did not get the tubular vision as in this case, and did not get the marked straightening out of the vessels. His own interest in this case was that it occurred in a colored individual, and he had never seen it before. If the case were luetic, he presumed active antiluetic treatment would be of material benefit.

DR. HARRY S. GRADLE thought it would be well to hold the diagnosis of retinitis pigmentosa in abeyance until it was seen how the patient progressed under antiluetic treatment.

#### **Neosalvarsan for Toxic Amblyopia.**

DR. COTTLE reported the following cases for DR. G. F. SUKER: A. S., gave a history of a "moonshine" debauch following which he became blind, and remained the same for two months when he entered the hospital.

At this time his vision was 3/200, discs definitely pale, and form fields constricted. There was also a well marked central scotoma for red. Patient had a chancre twelve years previously, but no other specific history, nor one of antisppecific treatment. Wassermann tests on blood and spinal fluids were negative. The patient was put on K. I.



and daily sweats. For over seven weeks this was done, at which time the vision was still the same.

On January 27, 1922, the patient was given 0.3 grams of neosalvarsan intravenously. Two days later the vision

dulgence in alcohol and tobacco, and one night he went on a spree and within thirty-six hours was unable to see any more than large objects a few feet in front of him. For eight months this condition prevailed, with but very

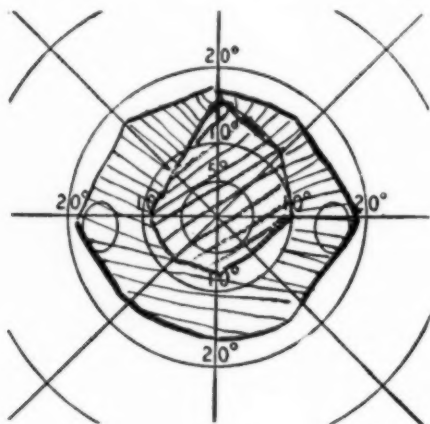


Fig. 1.

Fig. 1. Right eye, A. S., Dec. 8, 1921, central scotoma for red.



Fig. 2.

Fig. 2. Right eye, A. S., Feb. 20, 1922, scotoma: much smaller.

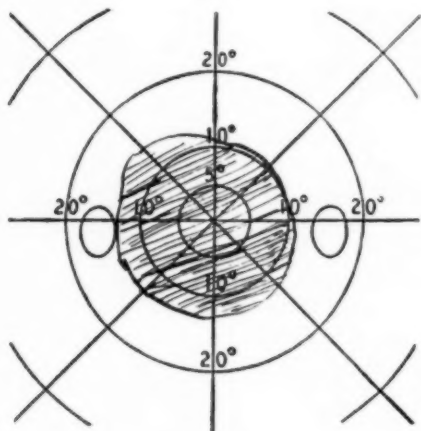


Fig. 3.

Fig. 3. Left eye, M. Z., Jan. 6, 1922, central scotoma.



Fig. 4.

Fig. 4. Left eye, M. Z., Feb. 20, 1922, scotoma smaller.

was 15/200 and 10/100. The patient also noted that he could see finer print. One week later another injection was given. Four days later the vision was 19/200, and two days after this 20/200. On February 14 an injection of 0.6 was given, and two days later the vision was 20/200 (10/70, 7/50). This is the condition at the time of writing.

M. Z., gave a history of excessive in-

slight improvement. He then entered the hospital.

His vision on entrance was R. E. 15/200; L. E. 20/200. The temporal sides of the discs were definitely pale. There was a central scotoma for red without much constriction of the form fields. Serologically the patient was repeatedly negative, and for ten days under close observation in the hospital



no change in vision was observed. Neosalvarsan, 0.3 grams, was injected intravenously. At this time there was started a daily injection of strychnin, which was the only other medication given. One week after the first, another injection was given, which was followed in five days by an improvement in vision in the left eye to 20/30. After another injection, one week later, the vision in the right eye was improved to 20/100.

*Discussion.* DR. SUKER stated: The question was why, in three cases—and a fourth one under observation—neosalvarsan or arsenical preparations accomplished so much good. Of the three cases, the third one was a soldier in whose case repeated spinal punctures were made. Methyl alcohol poisoning caused a ventricular and spinal hydropredema; and, in the first few hours of a retrobulbar neuritis, there was not manifested any particular change in the disc, except a slight elevation of the disc edge, particularly on the nasal side. This ventricular and spinal canal hydropredema disappeared usually within forty-eight to seventy-two hours, and then the optic disc picture ensued. There was really a moderate evanescent pressure edema of the nerve, which was followed by the retrobulbar neuritis.

The beneficial results obtained in these cases depend on two factors. First, the relief of pressure by repeated spinal punctures; second, the seemingly chemical antidote of the arsenic and as a nerve stimulant. Whether it was an antireacting agent was a difficult matter to determine; nevertheless, the fact was that neosalvarsan and other arsenicals did considerable good. These patients were in the hospital for several weeks before anything was done for them other than spinal drainage as reported. Many serologic examinations were made, all proving negative. These patients did not receive ordinary pilocarpin sweatings and usual treatment, but the spinal canal was drained almost dry on several occasions and the arsenicals used. He suggested a trial of these preparations and drainage of the spinal canal in similar cases. The

vision of these patients was now apparently stationary and the discs did not show any further atrophy as shown by maintaining a constant visual field.

#### **Tumor of Conjunctiva and Subjacent Tissue.**

DR. ROBERT BLUE presented the case of a young man in the early twenties, with a tumor of the right bulb of an unusual type. This tumor was situated beneath the bulbar conjunctiva, slightly elevated, sharply defined, and highly vascular. It did not extend into the cornea, but was confined strictly to the conjunctiva and subjacent tissue.

The history was that some twenty months before the patient discovered a growth in the eye without any irritation whatever. He had observed the case for eight months. During that time the tumor had not increased in size. The diagnosis was a benign neoplasm of unknown nature.

#### **Left Homonymous Hemianopsia.**

DR. EDWARD F. GARRAGHAN presented the case of a man, single, sailor by occupation, who had been a rather heavy drinker. He first saw him about the 15th of November, 1921, during an attack of pneumonia. At that time the vision was blurred, but this condition gradually cleared up entirely. Two months later the patient noticed that objects on his left side were lost to view, and he found difficulty in walking because he could not see to his left. On examination his vision was 20/20 in each eye. There was no paralysis of any of the external ocular muscles. The fundi of both eyes were negative. The field showed complete blindness of the temporal half of the right eye and the nasal half of the left eye. It was a typical case of left homonymous hemianopsia. Patient gave a history of a luetic lesion about twenty years ago. He gave a four plus Wassermann reaction, the Wernicke sign was present, and the lesion was, therefore, most likely confined to the optic tract.

#### **Increased Intraocular Tension.**

DR. THOMAS FAITH read the paper

reporting clinical observations on this subject which is printed in full, p. 352.

*Discussion.* DR. WILLIAM A. FISHER stated that the essayist had cited cases where miotics had been given by ophthalmologists of good repute, where he would have given mydriatics. Plus tension, without any eye pathology that could be seen, required miotics and a search for the cause. Plus tension with a cause that could be seen required a mydriatic and the removal of the cause.

All of Dr. Faith's reported cases would have been given the same treatment he gave them, if he had followed this procedure. His first case, plus tension, traumatic cataract, required atropin, but it might have been quite as well had he also removed the lens which was causing the plus tension.

Within the year, he had had a case of tension in each eye of 54 with 20/25 vision, where eye pathology could not be found; pilocarpin was instilled, enemas given and six teeth extracted, two at a time, ten days apart. When the gums had healed, enemas and pilocarpin were discontinued. Tension remained normal and vision improved to 20/15 plus.

Another case of tension 60, vision in each eye 20/200. Eye pathology could not be found. The teeth, tonsils and sinuses were normal. Miotics and enemas were given and tension returned to normal, and vision 20/25 in the left eye but 20/200 in the right which had an old scar. This case was seen by one of the members of the Society who advised an immediate operation.

Dr. Fisher believed that many cases of plus tension would escape an operation if the teeth, tonsils, sinuses, alimentary canal and blood were treated when necessary, and miotics or mydriatics used as indicated.

DR. HARRY S. GRADLE said Dr. Faith's paper was timely, because many cases of plus tension due to mechanical causes were overlooked, in the eagerness of a search for glaucoma. In these cases there was more or less mechanical obstruction of the canal of Schlemm. One might not be able to see it in the early stages, but sooner

or later it would appear. These cases were particularly apt to be found in younger people. He recalled to mind two young women, 20 and 22 years old respectively, in whom plus tension developed as a sequence of cyclitis, proved to be of tubercular origin. In some of these cases it was impossible to reduce the tension, and operation became necessary to establish a free outlet to the anterior chamber. One could make a diagnosis practically in all cases by a careful examination of the anterior aspect of the eye for evidences of exudation manifesting themselves on the posterior surface of the cornea.

In many of these cases one could bring the tension down to normal by the injection of 1/1000 adrenalin underneath the conjunctiva.

DR. FRANK E. BRAWLEY mentioned a case of simple chronic glaucoma, seen in consultation, with a small synechia. There was no way of telling when this occurred. The glaucoma had lasted for several weeks at the time he saw the case. Dilatation was effected under cocain, but after twenty-four hours miotics had to be resumed. The case went on to enlargement of the fields and quiescence under the miotics.

DR. FAITH agreed with Dr. Gradle that many of these cases were instances of mechanical obstruction. He reported a case he had watched carefully for weeks, but did not mention it in his paper, in which iridectomy was done with the idea that he had a primary glaucoma to deal with. Tension was reduced temporarily but came up again. He searched for foci of infection and removed them as well as he could. There was no exudation until several weeks after the tension had come down to normal. What brought the tension down he believed, was the improvement in general health and giving the patient a mixed stock vaccine. Then he saw shreds of exudate posterior to the ciliary body, but up to that time he could not see anything that looked like it. Where one would miss the exudates with the ordinary loupe and ophthalmoscope, he might be able to see them readily with

improved methods of examination, as with the slit lamp.

### Comparative Anatomy of the Eye.

DR. GEORGE E. KEIPER of Lafayette, Indiana (by invitation) read a paper on this subject, illustrated by stereopticon slides showing various types of eye from the simple eye spot to the eye of man and especially of the bird, as the most perfect organ.

DR. ROBERT VON DER HEYDT,  
Corresponding Secretary.

## COLLEGE OF PHYSICIANS OF PHILADELPHIA.

### Section on Ophthalmology.

Thursday, December 15, 1921.

G. ORAM RING, M.D., Chairman.

### Complete V-Shaped Discission for Zonular and Pyramidal Cataract

DR. S. LEWIS ZIEGLER exhibited two eyes operated on by complete V-shaped discission which were typical examples of slowly absorbing cortex due to calcareous deposits, and revealed the possibility of reclosure of the capsular sac from this cause, interfering with rapid solution of the lens substance, and in one instance requiring a secondary capsulotomy.

The patient, a female, aged 5 years, had always twisted her head in order to see with the left eye. The right eye showed typical zonular cataract, with sharply defined central pyramid of chalky whiteness. Apex, elevated and calcareous; surrounding cortex opaque, but periphery clear. Vision, 1/200, doubtful. Complete V-shaped discission was performed, but the cortex dissolved slowly, owing to its calcareous nature, and the capsule could not retract as freely as usual. Five months later, secondary capsular cataract, with calcareous pyramid persisting. V-shaped capsulotomy was performed, allowing calcareous nodule to drop down and back and leaving pupillary area perfectly free. Vision, with sph. + 8. D = 15/200.

In the left eye, there was a pyramidal cataract, with a small white nodule in center of anterior capsule and faint

haze in surrounding cortex. Vision = 10/200. Complete V-shaped discission was performed, and on the third day the lens was fully opaque, pushing forward against iris and causing it to bulge. Eye free from reaction or other evidence of ciliary pressure. Seven weeks later, absorption was found to be more rapid than in right eye, but slower than in the average case.

### Plastic Operation for Cicatricial Ectropion.

DR. T. B. HOLLOWAY exhibited a patient who had been injured by a wire rope containing a number of broken strands which had broken the nasal bones and lacerated the skin and the upper and lower lids of the right eye. At the time of coming under observation in November, 1920, there was a scar at the inner portion of the left upper lid, slight notching at its center, with a long scar that extended up and out across the tarsus and conjunctiva. The lower lid at its center showed a V-shaped defect completely thru the tarsus, and attached to the notch of the V was the apex of a symblepharon which extended from the fornix and bulbar conjunctiva. There was an entropion of a portion of the lower lid, adjacent to the outer limb of the V. The inner portion of the lid was everted, with marked curling outwards of the ends. There was also a defect at the lower portion of the internal canthus.

The first operation was performed in March, 1921, when the method suggested by Duverger was utilized with a most satisfactory result. A similar "halving" procedure was described by Wheeler in 1919. In July a somewhat analogous V-shaped operation was done at the internal canthus, associated with a sliding flap taken from the side of the nose. This was done to give additional tissue in case of cutting out of certain sutures. On November 8th, a very slight defect remaining at the internal canthus was corrected with a final result that might be regarded as perfect, with complete restoration of the lower lid and conjunctival cul de sac.

**Amaurotic Family Idiocy.**

DR. T. B. HOLLOWAY exhibited a Jewish female infant, aged fourteen months, the third child of healthy parents, without a history of consanguinity. The other children were perfectly healthy. The infant was born after normal labor, and continued to do well until the age of six months, when she developed whooping cough, and since that time has never regained her strength.

The child does not hold her head erect, and has not made any attempts to sit or stand alone. The head can be held up, but after a few minutes has a tendency to fall forward. The arms are usually kept extended and the fingers flexed. The grip of the hands is fair; when the arms are elevated and then released, they fall listlessly. At times one can note a slight athetoid movement in the forearms and hands.

An amaurotic stare is quite evident. No defects can be determined in the ocular rotations. The pupils are semidilated and do not react to light. In each eye there is a well defined optic atrophy associated with characteristic macular changes, the diameter of the gray white zone being about one and a half times that of the disc.

Dr. Holloway referred to the early reports before the Section made by Drs. Shumway and Buchanan, as well as later reports by the latter and Dr. Appleman. He referred to the pathologic changes observed by Holden, Shumway and Verhoeff, as well as exceptions taken by Coats after the statement made by Batten and Mayou concerning the analogy between these cases and family cerebral degeneration with macular changes, particularly as this relates to the existence of edema.

*Discussion.*—DR. WM. ZENTMAYER thought, from a case observed with Dr. Weisenburg, that when the child lives beyond the usual limit of two years, the macular changes may disappear leaving only optic atrophy. Under these circumstances it makes it difficult to reach a neurologic diagnosis, as it is well known that in certain

cases a differential diagnosis of this disease is dependent on the typical ocular findings.

**Keratitis Profunda.**

DR. H. MAXWELL LANGDON gave the history of a girl, aged 25 years, with irregular haze of the center of the cornea, about 5mm. in diameter, not staining with fluorescein, and with ciliary injection, but not much pain. All physical tests were negative. The blood examination indicated a moderate anemia (Hemoglobin 70%, R.B.C. 2,992,000, W.B.C. 3,000). There was an advanced atrophic rhinitis.

At the end of two weeks the infiltration became more dense. One month after the first examination, the eye was exposed to three one minute applications of radiant heat from Shahan's thermophore, the thermometer recording 160°. In seventy-two hours the temporal portion was thinning, and in one week the outer half had absorbed, leaving a thin superficial haze. Ten days later a second application of radiant heat, at 180°, was given, and in seventy-two hours there was absorption of the remaining portion of the dense haze, in ten days only a small spot less than 1mm. in size directly before the pupil remained. After a third treatment the haze entirely disappeared, leaving a thin film apparently just below Bowman's membrane. Nasal treatment, was continuous, and under tonics the blood condition improved. Dr. Zentmayer saw the patient, and considered the condition as typical of keratitis profunda.

It seemed probable that the anemia was secondary to the rhinitis, and that absorption from the nasal condition was the cause of the keratitis. The prompt resolution of the exudate in the cornea following each "heating" seemed to have been a direct result of the treatment, possibly by producing the death of bacteria, if there was an actual invasion of the cornea by them, or an absorption of inflammatory exudate by increased circulation. The thermophore was held just close enough to the cornea to avoid contact.



### Compulsory Application of Silver Nitrat to Eyes of New Born.

DR. EDWARD MARTIN, Commissioner of Health of Pennsylvania, said that the Department of Health desired to bring to the Section for answer a simple question: "Shall or shall not legislation be passed which requires the silvering of every newly born baby?" It is generally, tho not universally, accepted that this silvering properly applied will prevent the development of an infection acquired during birth. It is further generally accepted, that if the infection be gonococcal in nature and virulent in its course blindness may result, and does in sufficient number to contribute about 10 per cent. to our blinded population. Would this 10 per cent. be reduced to the vanishing point if the eyes of every child were silvered immediately after being born? Would it be reduced at all? Does the application of silver salts induce an inflammation which, supplemented by infection, may endanger the sight? These are subdivisions of the major questions. The enactments and rules bearing on this topic are as follows:

By the Act of June 5, 1913, every physician practicing in any portion of the Commonwealth, who shall treat or examine any infant suffering with ophthalmia neonatorum (inflammation of the eyes of infants) shall make promptly a report to the health authorities upon blanks supplied for that purpose, giving such information relating to the case as the health authorities may require. That midwives or nurses or other persons having the care of infants whose eyes have become inflamed or swollen within two weeks after birth, shall report the same in writing within six hours of the discovery thereof, and shall make a similar report in writing to some regularly qualified practicing physician of the district. It shall be the duty of the health department, immediately upon the receipt of such report from other than a practicing physician, to notify the parent or guardian or other person having charge of the infant, of the danger to the eyes of said infant by reason of neglect of proper treatment of the same.

Every physician who shall treat any infant's eyes for ophthalmia neonatorum, shall within 48 hours after he ceases treatment, report to the Commissioner of Health stating he has ceased treatment and noting the condition of the infant's eyes at termination of treatment.

By the Act approved June 5, 1913, the Bureau of Medical Education and Licensure is authorized to formulate and issue such rules and regulations as may be needful for the proper conduct of the practice of midwifery by midwives.

In accordance with this authority, the rule has been promulgated that promptly after the birth of a child, the midwife must cleanse its eyes with water which has been previously boiled, and then drop from a dropper into each eye one drop of an one per cent solution of nitrat of silver. The eyes are to be washed immediately thereafter with boiled sterile water.

It will be noted that ophthalmia neonatorum is defined in the act as inflammation of the eyes of infants. The popular concept of an infant is that of a child less than two years of age; the legal concept carries the child to 21 years. Inflammation is a vague term and may be slight or severe, incident to a great variety of causes. It is obvious that, if this act were rigorously obeyed reports, and quite useless ones, would be rendered by the tens of thousands. The term ophthalmia neonatorum is generally construed by the profession to mean a severe inflammation of the eyes, usually gonococcal in nature. It is upon this basis that reports have been rendered.

Dr. Wilmer Batt, the state statistician, notes that in 1920 there were 97 cases of ophthalmia neonatorum reported; of these, but 27 developed in the first week of life, the others thereafter. Infections after the seventh day were obviously secondary and not acquired during birth. Of the cases which were, or possibly were, infected during birth, there would be 3 in which laboratory examination confirmed the presence of the gonococcus. In none of these cases was there any permanent injury to the eyes. These



are the state records—inadequate, non-conclusive, but suggesting that crippling gonococcal inflammation of the eyes is less common than in former years. This in consonance with practically all infections.

Dr. Martin, with the data as presented, thought that the Section could give an answer to the question, upon which could be based suggested future legislation, in case it was believed to be needful.

*Discussion.*—DR. G. E. DE SCHWEINITZ reviewed the ways for preventing ophthalmia neonatorum, namely, education, compulsory notification, the punishment by law of offenders against properly constructed legal regulations, and compulsory prophylaxis. He detailed some investigations, which the Commissioner of Health and he had made as to changes which might with advantage be incorporated in the present Pennsylvania law, and explained why they had concluded at that time, that except for making some of its provisions (early reporting, etc.) more stringent, they would advance no other suggestions. They had both decided that the subject, of great importance, should be subjected to further exact study, and therefore the Commissioner had come before the Ophthalmic Section in the hope he could obtain from its members expressions of belief which would be valuable in shaping additional legislation.

Expressing a personal opinion, Dr. de Schweinitz said the Crédé method (a 1 per cent. solution of nitrat of silver preferred) continued to hold its place as a prophylactic; thus far it did not seem that a more effective substitute had been devised. It was necessary in institution work and in the eyes of those children who pass thru a birth canal known to be infected, or from which the suspicion of infection cannot be eliminated prior to birth.

But the practice of the method should be in the hands of those who are competent to use it, and he doubted the advisability of an unrestricted distribution of the silver prophylactic; he had seen too many severe reactions because of the ignorance of those who

employed it to think otherwise, and therefore felt that compulsory Crédé prophylaxis and the free distribution of the silver prophylactic were subjects which required additional study before a final decision should be reached, and tried to show how practically impossible it was to carry into effective operation a law of this kind. He detailed the advantages of compulsory notification, and quoted results in various States in support of this technic. He advocated the formation of a committee of oculists and obstetricians, whose duty should be, in consultation with the Commissioner of Health, to study the whole problem anew, and to make recommendations with respect to legislation in this regard.

DR. WM. R. NICHOLSON said there was no question as to the value of silver in the eyes of the new born as a preventative of gonorrheal infection, if its use is expertly carried out. He was not convinced, however, that it was in any sense a preventive in every case, and unless used expertly it has little if any value, while it may have distinct possibilities for evil. During the first three years in which the midwives were under the control of the Bureau of Medical Education and Licensure of this State, the use of silver was not insisted upon and it was practically not used. Since 1917, however, its use has been insisted upon, and it has been used in all cases routinely.

Since 1917, there have been delivered by the midwives of Philadelphia county, 33,726 babies, and the statistics which follow, are based upon this number of cases, all of which have been inspected by the graduate physicians employed by the Bureau for this purpose. There had been reported 85 cases of ophthalmia neonatorum, showing a smear which was positive for the gonococcus, in which silver has been used in each case; also fourteen cases of gonorrheal ophthalmia with positive smear, in which no silver had been used. With three exceptions, all the cases recovered without injury to the eyes. In the three above mentioned cases, the reason for the failure was

parental interference in two; while in the third, in which both eyes were lost, it was due to ignorance of the parents and neglect in reporting upon the part of the midwife. This midwife lost her license as a result of this negligence.

A decided increase in the number of sore eyes of a nonspecific nature has been found since the use of silver was insisted upon. Up to this time, however, there has been no report of ill results from ophthalmia due to chemical irritation. Finally, there has been no decrease, but if anything a slight increase in the number of cases of gonorrheal ophthalmia reported since the use of silver was insisted upon. All cases having sore eyes must be reported promptly by the midwife to the inspector who has her in charge, and every case is carefully followed until its cure has been attained.

Dr. Nicholson believed that the report of all cases of ophthalmia neonatorum should be made promptly to the proper authority, with the idea of insuring proper treatment to the new born infant, and that there should be some definite punishment inflicted if such report is not made. If the use of silver is alone insisted upon; that is, without the inclusion of the reporting clause, little will be gained, because of the ignorance among the midwives. He favored the use of silver in well organized hospital services, and used it as a routine in his services at the Presbyterian, and the Methodist hospitals, and the Graduate School of Medicine of the University of Pennsylvania.

DR. BARTON COOKE HIRST believed that midwives, hospitals and dispensaries should be required to use the Cr  d   method, but that physicians in general should use their judgment in the individual case.

DR. LOUIS LEHRFELD (by invitation) said that an analysis of cases reported to the Bureau of Health of Philadelphia shows that, while a large proportion of cases occur during the first three days after birth, a fair number occur during the first two weeks and rarely as long as one month. In 1919, there were reported 60 cases, 27 of which were positive for gonococcus, having

an incubation period from one to thirteen days; in 1920, 82 cases, 35 with an incubation period from one to eleven days. These data were obtained by medical inspectors of the Health Department. Similar data obtained of cases in 1917 by a trained public health nurse showed an "incubation period" common during the first two weeks and in one instance, as long as one month. The large number of cases occurring after the third day has a direct bearing on the use of a prophylactic, indicating either that the medication used inhibited the growth of the gonococcus, or that the organisms were of low virulence, or that the prophylactic used was ineffective or insufficient.

Dr. Lehrfeld believed that silver, as commonly used, is not a positive prophylactic for ophthalmia neonatorum. He felt that one instillation of one drop of any solution, silver or other, gives a false sense of security, and safety, and suggested that a bland antiseptic solution other than silver be used, and, instead of one drop, several drops should be instilled on three successive days.

Summarizing the records of blindness thruout the country, there were in 47 schools for the blind in 1920, 4144 pupils, of whom 997, or 24.1 per cent., were blind from ophthalmia neonatorum. The admission rate from this disease was 26.6 per cent. in 1907-08 in the schools, which rate decreased until 1917-18, when the rate was 14.7 per cent. This ratio increased in 1918-19, and in 1919-1920 the admission rate was 23.2 per cent. These figures correspond with those from the Pennsylvania Institution for the Instruction of the Blind, where the percentage varied in different years from eight to fifty, and during the last 30 years averaged 26. He concluded that the blindness from ophthalmia neonatorum has not decreased in the proportions ordinarily supposed.

DR. J. HILAND DEWEY said he desired to direct attention to the subject from a rather different angle. Practicing in New Jersey where this law is in effect, he was frequently embarrassed by threats of law suits against doctors

who have not used the drops at the time of birth. The public is soon educated to the fact that the drops are required by law. The infants are brought to you, and no matter what the cause of the sore eyes may be, it is ascribed by the parent to the omission of the drops. Recently he saw a child, three weeks old, with congenital dacryocystitis, and the mother threatened a lawsuit against the physician who attended her for neglecting to use the drops.

DR. T. B. HOLLOWAY referred to the number of cases that had been officially reported to the State Health Department, and felt that these were considerably less than the number of cases that had probably developed in the State. He alluded to the estimate he had made some years ago in the study of this subject. He stated that in the two schools for the blind in this State one hundred and twenty-two of the cases were the result of ophthalmia. The importance of the subject could be appreciated when it was realized that at the present time it costs over \$600.00 a year to educate a blind child.

Concerning some of the figures submitted in regard to the percentages in schools for the blind, he thought it ought to be stated that Dr. Lehrfeld had included statistics from the institutions operated in connection with the public school system in some cities.

He was opposed to a compulsory law for the use of nitrat of silver for physicians and midwives, altho he appreciated the importance of its use by proper hands, in proper institutions, and in proper cases. What he objected to was the compulsory routine general use of the drug.

DR. JAMES THORINGTON said he was sorry that there had been any statement made which would reflect discredit upon the use of a one per cent. solution of nitrat of silver in the sore eyes of new born babies. He did not feel that this silver solution, when properly employed, would produce an inflammation of the eyes resembling ophthalmia neonatorum.

### Toxic Amblyopias with Cases.

DR. G. E. DE SCHWEINITZ reviewed the clinical histories and results of treatment in four cases of toxic amblyopia, as follows:

Case I. *Quinin blindness*, the examination having been made twenty-eight years after its onset. At the time of examination, the patient was a woman aged 53, who when 25 years old, took "huge doses of quinin," given during the period of a complication following childbirth. "Total blindness" lasting one month supervened, followed by gradual restoration of vision. At the time of examination, direct vision was greatly restricted for white and colors, and followed the types first described by H. Knapp, in that they were somewhat oval in shape, the long axis being horizontal. There was marked reduction of light sense (less than 1/10 with de Wecker's photometric types). The discs were paper-white and the vessels reduced to threads, and there was distinct arterial perivasculitis.

Dr. de Schweinitz referred to other cases of blindness from this cause, when the examination had been made years after the onset of amaurosis, in one case 35 years; to the vascular changes which he had noted experimentally, and which had been described by a number of authors in the human subject; and to the inconvenience which reduction of light sense, usually permanent, caused, occasionally resulting in a psychasthenic state with serious consequences.

Case II. *Amblyopia in a Dye Worker*. The patient, aged 56, began ten months prior to his examination to note failing vision, which increased. He had stopped smoking, and the use of alcohol. Both discs showed the usual papillo-macular area of atrophy; there were large central color scotomas; vision O.D. 5/30, O.S. 3/60. As long as he remained at his occupation treatment had been unavailing. Gradually, after stopping his work and under the influence of alteratives, strychnia, diaphoresis and negative galvanism, improvement began. After seven months of this treatment, vision rose practically to the normal stand-

ard, 6/9, and the scotomas disappeared, save only for a slight deficiency of color perception directly over the fixing point. While at work, the patient was constantly in contact with anilin dyes (red and blue), and with *bisulphid of carbon*; he also used much sulphuric acid and caustic soda, sulphid of sodium and hydrochloric acid. The patient attributed his trouble to the "noxious fumes" he frequently inhaled.

Dr. de Schweinitz discussed the subject somewhat from the clinical standpoint, with the help of Dr. George Meeker, but as no opportunity for chemical examination of the substances referred to had been possible, this discussion was largely speculative. While it was not proved that this amblyopia was definitely due to these chemicals or their products, Dr. de Schweinitz after very careful examination, could find no other cause, and he thought it likely that the case belonged to the group of amblyopias which are attributed to bisulphid of carbon, which had years ago been so elaborately investigated in England.

Case III. *Tobacco-Alcohol Amblyopia; Relation of Intestinal Stasis.* The patient, a man aged 60, had used alcohol and tobacco excessively, and had a clear history of long standing intestinal disturbance; also of gastric ulcer. Vision O.D. 6/100; O.S. 6/60—; typical scotomas and pallor of the discs. Treatment of various kinds, including a course at Hot Springs, had been followed by slight improvement (the patient probably abstaining from his bad habits for a time), but he had relapsed, and vision continued to fail. At the time of examination, the patient's breath was exceedingly unpleasant, its odor being like that noted in diabetes, but there was no glycosuria, and medical examination revealed notable intestinal stasis, the colon being literally packed with hardened feces. Restoration of the normal intestinal functions, and strict abstinence from tobacco and alcohol resulted in three and one-half months in a return of normal vision and disappearance of the scotoma, a condition which obtains at the present time.

Dr. de Schweinitz discussed in connection with this case the views long ago expressed by Horner and Sachs, that intestinal toxins elaborated from gastrointestinal catarrh caused by the abuse of alcohol and tobacco bore a greater responsibility in creating these amblyopias than either the alcohol or tobacco itself. He emphasized the importance of treatment of the gastrointestinal tract in all cases of toxic amblyopia.

Case IV. *Amblyopia Wrongly Attributed to Lenticular Changes, Really Toxic.* A man, aged 71, who in early life had lost one eye by virtue of an accident, but who had always maintained excellent sight in the remaining eye, began three years ago to note failure of vision, and, Dr. de Schweinitz being absent at the time, he consulted a colleague who found a vision of 6/22 (previously it had been 6/6), a few striae in the lens and slight perinuclear haze, to which the fall in visual acuity was naturally attributed.

Three months later, examination revealed a vision of only 5/150, but no increase in the lens changes, therefore quite out of proportion to the effects of such an incipient cataract formation. The man had all his adult life been a steady, but not excessive, smoker; he did not abuse alcohol. A careful perimetric examination revealed a large oval central scotoma for colors (red, blue and green). His tobacco was stopped, he was fully purged and iodid of potassium and strychnia were exhibited. Very quickly improvement began, and at the expiration of two and one-half months vision had risen to 6/12, and he could read ordinary print with ease.

Dr. de Schweinitz emphasized the importance of perimetric examination, especially of the central area of the field, in all cases of disturbed and failing vision; and also referred to the fact, which he had elsewhere recorded, that occasionally the onset of tobacco amblyopia is postponed until quite late in life, when the subject, altho a steady smoker, is not necessarily an excessive one.

Dr. de Schweinitz also referred to



one patient, seen in consultation, on whom an excellent operation for cataract extraction had been performed by a colleague, resulting, however, in very poor vision. A large central scotoma was found, probably due to abuse of tobacco and perhaps alcohol. The patient had been lost sight of, and more details could not be given. He also referred to a case of toxic amblyopia in a Chinese studied in Dr. Howard's Clinic in Peking, the loss of vision having followed soon after the patient had drunk freely of vinegar in which green peppers had been steeped. The rapidity with which the vision had failed suggested that the vinegar had been contaminated with methyl alcohol, altho as none was available for analysis, this could not be proved.

#### **Persistent Hyaloid Vessels in Canal of Cloquet.**

DR. HUNTER W. SCARLETT exhibited a girl, aged 21 years, with vision of light perception in right eye since birth; external examination, negative; left eye normal. Ophthalmoscopic examination with sph. + 16. D. lens showed a large grayish-white mass posterior to the lens and slightly to the temporal side. Proceeding from this mass was a stalk which extended back to and was attached to the disc. The size of this stalk was about that of the disc, and contained vessels filled with blood, which reached from the disc to the bulbous expansion in the anterior part of the vitreous. About two d. d. to the nasal side of the disc was a large irregularly shaped white mass with long projecting arms. This was traversed in places by vessels. Several areas of old choroiditis were distributed thruout the fundus.

Parsons describes a somewhat similar condition, as do also Collins and Mayou. Parsons quotes de Schweinitz and Randall as having reported a case some years ago, and gives in detail the various abnormalities that may exist as a result of the remains of vestiges of this structure and in conjunction with it, the most common being colobomas of iris, choroid, and disc.

CHARLES R. HEED, M.D.

Clerk.

#### **COLORADO OPHTHALMOLOGICAL SOCIETY.**

FEBRUARY 18, 1922.

DR. D. A. STRICKLER presiding.

#### **Episcleritis.**

W. C. and W. M. BANE, Denver, presented a woman, aged forty-seven years, who since the early part of December, 1921, had suffered from an episcleritis of the right eye. There had been a great deal of pain, severe photophobia, lacrimation, and blurred vision. The patient also complained of rheumatism and of having a great deal of gas in the abdomen. There was an earlier history of corneal ulcers. During the present attack, the patient had been instructed to confine herself strictly to a nonstarchy, nonsugar, and vegetarian menu. Her teeth had all been removed seventeen years previously. The upper and outer portion of the eye was deeply injected, and at or near the insertion of the superior rectus were two small whitish elevations, each about one mm. in diameter. Atropin had given the patient only temporary relief. A subconjunctival injection of guaiacol, one c.c. of a one percent solution, had been given twice at an interval of four days. Examination of the nose was negative. The tonsils were diseased, but small. A supplemental report on March 18 stated that atropin had been resumed twice daily, and that Prince's pasteurizer had been used over the elevations three times. Gradually the elevations had disappeared and congestion diminished. Another temporal blister was applied on February 28, and was beneficial in reducing pain. High frequency current, used during March at each visit, had been coincident with a marked improvement in appearance, vision, and comfort of eye.

*Discussion.*—MELVILLE BLACK, Denver, favored a free rather than a restricted diet.

W. H. CRISP, Denver, felt that atropin should be used quite frequently, even as often as every two hours.

J. A. McCaw, Denver, suggested that the chest should be examined, and the possibility of tuberculosis considered.



C. E. WALKER, Denver, had seen a similar case in which investigation along every other line had failed; when Dr. O. S. Fowler decided that there was a floating kidney; with the result that after the kidney was fixed the patient got along perfectly well, the eye having now remained quiet for two months.

EDWARD JACKSON, Denver, suggested that application of the thermophore over the nodules might bring about an improvement.

#### **Buphthalmus.**

W. C. and W. M. BANE, Denver, presented an infant aged eighteen months, who had been first seen in January, 1921, the parents having noticed that the right eye seemed larger than the left, and that the surface of the eye looked hazy. At that time the cornea of the right eye measured about one mm. more in diameter than the left, the cornea appeared steamy, and the eyeball was hard upon palpation. At a later date the tension was found to be sixty-six mm. of mercury, and the cornea measured twelve mm., while that of the left eye was ten mm. in diameter. A one percent solution of pilocarpin was ordered for use three times daily, but a few months later the tension and appearance of the eye were the same. No improvement was obtained under the use of thyroid tablets prescribed by the pediatricist. The present condition was practically that of a year ago. Should the eye be trephined?

*Discussion.*—MELVILLE BLACK, Denver: I have been watching a similar case from time to time, and am surprised how little change there has been in the course of several years. In the case which I refer to, both eyes are affected, and I have advised trephining of one eye, being then guided by the result as to the course to be followed in the second eye. In the case here presented, unless symptoms arise, I think a waiting policy would be justified.

W. H. CRISP, Denver, felt that ultimately the eye would probably have to come out; but that, in order to favor

the development of the orbit, the eye should be retained as long as there were no objectionable symptoms.

D. H. COOVER, Denver. I have a patient whom I first saw at three years, and who is now six years old. Both corneas were steamy, and the tension as taken with the fingers was plus two. Under eserine, half a grain to the ounce, twice a day, the corneas have become absolutely clear. The eserine is being used regularly.

C. E. WALKER, Denver, was disposed to consider rather operative than medicinal treatment in cases of buphthalmus with high tension; and had obtained satisfactory results from a filtering scar.

#### **Posterior Cortical Cataract.**

J. M. SHIELDS, Denver, presented a man, aged twenty-two years, who had served for three years in Europe in the recent war, and denied having any eye trouble prior to receiving a shrapnel wound over the left eye on June 8, 1918, and a severe gassing the following morning. He stated that after his gassing he had been totally blind for about six weeks, after which the vision had gradually improved for two years or so. The vision was now R. 5/30, L. 5/10. Various tests, including several Wassermanns, urinalyses, and X-rays of the nasal sinuses and teeth, had been negative. There was bilateral posterior cortical cataract, much more marked in the right lens than in the left. There were a good many opacities in the left vitreous. Was the condition due to the war injuries or to a uveitis?

*Discussion.*—W. C. FINNOFF, Denver. The eye changes from gassing are superficial and due to a local chemical irritation. Possibly this case can be explained on the basis of air concussion, as was reported in regard to a number of cases of injury, without direct contact, from missiles moving at great velocity.

EDWARD JACKSON, Denver. The form of the lens opacity is rather suggestive of trauma, especially in the right eye where the opacity is more definite.

**Retinal Detachment.**

J. M. SHIELDS, Denver, presented an artilleryman, aged twenty-four years, who dated his ocular disturbance from August, 1918, when he had received a small foreign body in the left eye while he was on duty at target practice. According to his statement, the vision had begun to fail about two weeks after the slight accident, and at the same time he had noticed diplopia, the image seen by the right eye being higher than that of the left. There was a massive detachment of the left retina.

*Discussion.*—MELVILLE BLACK, Denver. The retina has not the light color that we get in the average detachment. We have to take into consideration two possibilities, first that this eye contains a foreign body which penetrated the sclera, and second that there is a subretinal growth.

E. R. NEEPER, Colorado Springs. If there is a foreign body in this case. I shall be surprised if it is not in the postorbital fat.

**Hemorrhage Following Old Ocular Injury; Two Cases.**

W. C. FINNOFF, Denver, presented two cases of intraocular hemorrhage occurring many years after injury of the affected eye. In the first patient, a girl aged fourteen years, the right eye had been contused by a rock six years previously, the vision being lost at the time of the accident. Two operations, probably needlings, had been done, the last one two years previously. The iris was said to have looked green until a year ago, when it was noticed that it had turned brown. Two months ago it had been noticed that the eye looked red. There had been no pain in the eye since the time of the injury. When the patient was first seen two weeks ago, there was a hyphema filling the lower third of the anterior chamber, and on the iris were several large bloodvessels running toward the pupil. In the upper part of the pupil, a thin bright red mass of blood was seen on the anterior capsule, and a small amount of blood still remained in the lower angle of the anterior chamber.

The second case was in a man aged forty-four years, whose right eye had been injured thirty-two years previously by the back firing of a shell from a rifle. The eye had been contused but not perforated, and after the reaction subsided had had eccentric vision to the right. The patient had been informed that the iris was atrophied on the nasal and lower side. The eye had remained quiet until seven years previously, when circumcorneal injection was noted after exertion. Six years ago the patient had noticed a small hemorrhage in the anterior chamber, which partially covered the visible iris, and which became absorbed in the course of two months. There had been a second hemorrhage two or three years ago, which became absorbed in three weeks; and another hemorrhage a year later, which was absorbed rapidly. Last September, a large hemorrhage developed in the anterior chamber, and in the course of two months the chamber became completely filled with blood. There was a full sensation in the eye, and the blood was absorbed gradually. At the time of presentation, there was a triangular blood clot occupying the lower two-thirds of the anterior chamber. With the corneal microscope, distended new formed bloodvessels were visible above the clot. There were several white masses in the iris stroma.

*Discussion.*—MELVILLE BLACK, Denver, thought that in the girl's case there might be a tumor.

C. E. WALKER, Denver, favored the removal of this type of eye.

D. A. STRICKLER, Denver, thought that such an eye would be more useful to the pathologist than to the patient.

DR. FINNOFF. These patients are not willing to have the eyes removed. The question has been raised whether the man has a piece of copper in his eye. If he had, there would probably be changes in the color of the eye.

**Microphthalmus.**

W. C. FINNOFF, Denver, presented a boy aged three years each of whose eyes was microphthalmic. The cornea of the right eye was about five mm. in diameter, that of the left about seven

mm. Each iris presented a typical coloboma down and in, and in the left eye there was a large corresponding coloboma of the choroid. There were also intermittent convergent squint and marked lateral nystagmus. With the left eye, the child could easily detect objects by tilting the head. He was the fifth of a family of six children, the rest of whom were normal. There was no history of congenital disorders in either the maternal or the paternal family. In addition to the ocular defect, the patient presented defective development of the premaxilla on the right side, which left a wide cleft of the upper lip; but the palate was not cleft.

#### **Abscess Metastatic In Eye.**

A. C. MAGRUDER, Colorado Springs, reported a case of metastatic abscess at the insertion of the inferior rectus muscle of the right eye, following a carbuncle on the neck. The patient later developed an osteomyelitis of the ischium, which was opened and curetted; and still later eight subcutaneous metastatic abscesses in various parts of the body. Each of these subcutaneous abscesses was unaccompanied by definite pain, but was found by the presence of local tenderness while the patient was being massaged by his nurse. In every instance the pus evacuated from the abscess furnished a pure culture of staphylococcus albus. The eye lesion caused slight redness and fullness of the eye, but no pain; formed a two mm. elevation about four mm. in diameter; and yielded about two minims of pus. There was a definite slough which came away after three days, the wound promptly healing.

*Discussion.*—W. H. CRISP, Denver, referred to a case of metastatic abscess in the background of the eye, reported by W. T. H. Spicer in the transactions of the Ophthalmological Society of the United Kingdom for 1907.

E. R. NEEPER, Colorado Springs, referred to two cases of metastatic abscess which he had encountered in his own practice. One was in a negro who finally died of meningeal symptoms. The anterior chamber gradually filled

with yellow pus without any prodromal uveitis. The primary focus was probably in the neck. The second case was in a white woman who was opened up at perhaps as many as twenty-five to fifty points in various parts of the body, but finally got well. There was a bulging of the conjunctiva and of Tenon's capsule, and a few days later the anterior chamber was full of pus and the eye had to be removed. In this case the primary focus was in the arm.

D. A. STRICKLER, Denver, suggested investigation of the question of hypothyroidism in Dr. Magruder's case.

EDWARD JACKSON, Denver, suggested that the pus from Dr. Magruder's case should be tested as to whether it would produce the same condition in animals.

W. C. FINNOFF, Denver, suggested injections of foreign protein, three to five c.c. of sterilized milk, subcutaneously, or intragluteally, every day or every other day.

WM. H. CRISP,  
Secretary.

### **SAINT LOUIS OPHTHALMIC SOCIETY.**

Meeting October 28, 1921.

DR. A. E. EWING Presiding.

#### **Amblyopia Ex Anopsia.**

DR. WM. H. LUEDDE read a paper, to be published in full in this journal.

*Discussion:* DR. J. W. CHARLES. In spite of Dr. Luedde's limitation of his subject to "Ex Anopsia," one cannot avoid wondering how many of the so-called "Ex Anopsias" are not the result of retinal hemorrhages caused by pressure in the head at birth, which absorb so completely that later the ophthalmologist can find no trace of a lesion. In 1895 Professor Heller, pathologist of the University of Kiel, turned over to me an eye of a new born child, removed in a postmortem examination. The retina was hemorrhagic in almost every section. In looking up the literature, I found a report of over twenty such cases. Since the time necessary for recovery of vision and fusion ability varies so greatly,

how can one tell how long to continue treatment? For this reason one of Dr. Luedde's cases is exceptionally interesting.

#### Membranous Cataract.

DR. HAYWARD POST: A girl, E. B. C., aged 15, came under my notice April 16, 1920, who had pupillary membranes in both eyes, so dense that vision O. D.—fingers at one foot; O. S.—fingers at three feet. Both membranes were needled, resulting in a gradual improvement of vision. Immediately following the operation there was considerable confusion and embarrassment, as common objects, such as pen knives and letters of the alphabet, were not recognized. This knowledge has gradually been acquired, so that the patient is much more capable of taking care of herself. But on the whole the result has been rather disappointing, as at present, a year and a half after the first operation, the vision with correction is only 3/192, either eye.

#### Chronic Simple Glaucoma Without Increased Tension.

DR. HAYWARD POST presented the following: K. W., female, eighty-two years of age, reported first on December 1, 1920, complaining of loss of vision, for which she desired a change of glasses. Vision, either eye, with or without glasses—18/38. Ophthalmoscope showed O. D. 4 diopters, cupping with definite breaking of the course of the vessels at the disc margins. O. S. slight pallor of disc; 1.5 diopters cupping. Attempts to map the field of the right eye were never successful. The field of the left eye was contracted and had a typical paracentral scotoma. Schiötz tonometer O. S. 17 mm. Hg., O. S. 19 mm. Hg. This condition has not varied during the course of the treatment, tho the tension has been taken and the left field has been mapped many times, and at different times of the day. Unfortunately no color fields have been taken. Pilocarpin has been used three times a day. Dr. Hardy reports that an examination of this patient nearly five years previously showed a similar condition.

Fuchs states that iridectomy and

miotics are of little value in these cases. Elliot believes that trephining is of no value. Horstman is of the opinion that they are cases of simple optic atrophy. Personally, I am inclined to think that normal pressure will produce glaucomatous changes in certain eyes where the tissues are of subnormal resisting power and that such is the condition of this case.

*Discussion:* DR. J. W. CHARLES. Why is it that in glaucoma with a comparatively low intraocular pressure we frequently see a deep cupping of the disc, while in other cases with high pressure the cupping is more shallow? It would seem that in some eyes the lamina cribrosa is more resistant than in others; yet according to Elliot the problem is more complex and the sequence, from the notes of four cases of Fuchs' would seem to be (1) Disappearance of the delicate anterior glial fibers. (2) Disappearance of the deeper glial fibers in the lamina. (3) Bending backward of the connective tissue lamellae of the lamina. (4) Compression, sclerosis, even thickening of the lamina; and (5) thinning and atrophy of the lamina as a result of continued pressure.

DR. LAWRENCE POST. That the possibility of a temporary elevation of tension at some earlier period may have been the cause of the signs and symptoms in such a case of glaucoma as the one described by Dr. Hayward Post, is well illustrated by a patient whom I have been watching for the past four months. L. N., 26 years old. Past history: Health always good. Four years ago had an attack similar to the present one in every respect except that there was a complete (?) recovery in two months. Present illness: Three months previous to consulting me there began a slow loss of vision in right eye entirely without pain. Vision equalled ability to count fingers eccentrically at one foot. Marked glaucomatous cupping of disc. Tension, right eye, 42; left eye, 12 (Schiötz). After using pilocarpin grs. 1/240 every four hours for two weeks there was no change in tension. The strength of the pilocarpin was increased to grs. 1/20 and after two weeks the tension was O.D.



20 and O.S. 20. One month later tension was O.D. 12; O.S. 12. The drug was then reduced to grs. 1/240, three times a day, and after two weeks the tension was O.D. 12; O.S. 17. The pilocarpin was further reduced to grs. 1/480 once a day. Two weeks later the tension was O.D. 16 and O.S. 13. I feel that the eye has just passed thru another period of high tension and will go along now for a time with normal tension without any miotic. The field in the left eye was reduced one-quarter when first seen, but at no time has there been other evidences of disease in this eye.

The youth of the patient and the long intervals between the unexplained elevation of tension makes the case of interest, the latter feature illustrating the necessity of considering, in cases of apparent glaucoma without increased tension, the possibility of these having been increased in the past life of the patient.

#### Increased Hyperopia in Diabetes.

DR. HAYWARD POST presented C. F., female, aged fifty-seven, who had been a patient at the office for about thirty years. February 1, 1915, patient was given a slight change in glasses:

O.D. + .25c. Ax. 180° V=20/15.

O.S. + .75c. sph.  $\ominus$  +0.87c. Ax. 180° V=20/15.

She required + 2.25 added for reading. Later she reported blurred vision, with glasses, O.D. V 20/96; O.S. V 20/120. The ophthalmoscope showed slight hyperemia of discs and retina, confirmed by Dr. A. E. Ewing. Dr. H. W. Soper reported that one month previously he had found sugar in the urine, but that she had now been sugar free for the past three days, but that there were still large quantities of acetone and diacetic acid.

On October 10th vision O.D. with +0.75 sph. added to present glasses, was 20/15 and O.S. with +1.00 sph. added, 20/15. +2.25 sph. was still required as a reading addition. By November 20th, the patient still remaining sugar free, the additional hyperopia had disappeared, and the vision, either eye, was 20/15.

CASE II. Mrs. J. T. Mc., female, aged sixty-one, was given

O.D. + 3.00 d sph. + .75c. Ax. 45° V 18/24.

O.S. + 2.75 d sph. + .75c. Ax. 132° V 18/15.

With + 3.00 sph. added for reading. Later, glasses not satisfactory; O.D. V 18/60; O.S. V 18/19. The ophthalmoscope showed some edema of either retina and the normal physiologic cups were absent. She stated that she is under treatment for diabetes. With + 1.00 sph. added, O.D. V 18/30.

I told her to await developments and and report in about one month but have not seen her since.

Fuchs states that there are two main causes for hyperopia in diabetes;

1. Increased refractivity of media.

2. Shortening of the eye ball which may result from tumor or edema under the retina. The probabilities are, that increased hyperopia in these cases is due to edema of the retina.

*Discussion:* DR. J. W. CHARLES. In a recent discussion by the Ophthalmological Society of the United Kingdom, of "Ocular Disturbances in Diabetes," Garrod stated that the theory that the cataract of diabetes is caused by osmosis from the lens because of the amount of sugar in the blood, is no longer tenable; because the amount of sugar in the blood is too small and also sugar has been found in the lens. It would seem, therefore, that Dr. Post is correct in excluding lens changes from the possible causes of his case.

#### Changes in Refraction.

DR. LAWRENCE POST presented a statistical report in patients observed over a long period of years.

JOHN GREEN, JR.,  
Editor.

### ST. LOUIS OPHTHALMIC SOCIETY.

NOVEMBER 25, 1921.

DR. A. E. EWING, Presiding.

#### "Ophthalmic Illuminator."

DR. W. E. SHAHAN presented this new instrument.

#### Subnormal Accommodation.

DR. J. F. SHOEMAKER presented case reports as follows:

In January, 1905, Dr. Geo. M. Gould



published a paper on "Subnormal Accommodation and Premature Presbyopia," reporting twenty-seven cases, illustrating the subject.

He said: "Many of our puzzling non-successes are due to failure to recognize insufficient or parietic accommodation or premature presbyopia. There is no test by which the fact may be learned, because for the time required in the ordinary tests there is almost always the ability to hold the vision perfect, or seemingly so, by an effort which exhausts with long continued reading, writing or sewing."

The following two cases appear to belong in this class:

CASE I. J. B. M., aged 20, consulted us in July, 1918, complaining of eyes burning and feeling dry.

V.O.D.—18/30=Jaeger No. 1 at 3".

V.O.S.—18/30=Jaeger No. 1 at 3".

Under homatropin cycloplegia:

V.O.D. w—1.00 S.  $\odot$  +1.75 C. ax. 90° =18/15.

V.O.S. w—1.50 S.  $\odot$  +2.75 C. x. 90° =18/15.

These glasses were prescribed for constant use and he was given some drops to use. The muscle test showed orthophoria for distance; 10 degrees exophoria for near.

A month later he complained that his near vision blurred in the afternoons and eyes still felt dry. Drops were continued. After two weeks more, near vision still blurred and head ached some the latter part of the day. Pilocarpin gr. 1/6 to the fluid ounce was added to the collyrium t.i.d. Three weeks later eyes were better, but still had headaches when he used eyes during evenings. Pilocarpin was increased to gr. 1/4 to the ounce.

This relieved the headaches and his near vision was good. For a period of six months he got along nicely so long as he used the drops, but N.V. blurred and head would ache the latter part of the day if he stopped them.

After six or eight months, he got along nicely by using the drops once or twice daily, and a little later was able to discontinue them entirely with no further trouble.

Miss B. W., aged 22, came complaining of pain in eyes, forehead and occiput. She was wearing +1.00 S.  $\odot$  +.25

C. ax. 180°, right and left, with which she said her distant and near vision were good.

Under homatropin cycloplegia she accepted:

O.D. +1.00 S.  $\odot$  +.25 C. ax. 180° =18/15.

O.S. +1.25 S. =18/15.

In the postcycloplegic examination she accepted:

O.D. +1.00 S.  $\odot$  +.25 ax. 180° giving her 18/12 vision and Jaeger No. 1 at 4".

O.S. +1.00 S. giving 18/12 vision and Jaeger No. 1 at 4".

She had practically orthophoria.

These glasses were given her. She was referred to a rhinologist who reported hypertrophy of both middle turbinates.

Six weeks later she reported that she could not read any length of time without it making the back of her head ache. She was given drops with one-fourth grain pilocarpin to the ounce to use three times daily.

Three months later she reported that her eyes were more comfortable; but that she got a pain in the back of head as soon as she read or sewed, or when travelling in car. Thinking that while the test showed normal accommodation there might, nevertheless, be a weakness of the ciliary muscles which caused trouble when eyes were used continuously for near work, I placed a +1.25 S., right and left, over her distance glasses and had her sit in the waiting room and read. With these additional glasses she read with perfect comfort for two hours, not having a trace of the usual occipital headache. Accordingly she was given

O.D. +2.25 S.  $\odot$  +.25 ax. 180°.

O.S. +2.25 S.

for near work. Several days later she stated that she had read as long as three hours continuously without any headache.

Two and one-half years later she reported that she had worn the reading glasses with perfect comfort for about one year and then had gotten along comfortably with the distance glasses, until two months previously when she began to have occipital headaches again. As she had broken her glasses she was given her full distance correc-

tion and some pilocarpin drops, and presumably she got along comfortably with these as I have not heard from her since.

#### **Edema of Lids Due to Endocrin Disturbances.**

DR. J. F. SHOEMAKER said numerous observers have reported conjunctivitis and excessive lacrimation occurring in patients after removal of the thyroid glands, and also in myxedematous patients. The following two cases had these symptoms and in addition another worth while noting, viz.: swelling, or edema of the eyelids. This last symptom is one that might be expected to occur in patients whose thyroid glands were secreting much under the normal amount of thyrotoxin, as in myxedema there is often much thickening and swelling of the skin, to such extent even as to decidedly change the patient's expression and appearance.

The first patient, Mrs. J. R. C., consulted me suffering with a chronic conjunctivitis and considerable lacrimation. She stated that she had been having frequent colds in head. Blood pressure was 165. She was treated for the conjunctivitis several weeks and improved considerably but did not get entirely well. Six weeks later she returned with eyes watering and lids swollen and edematous. She was referred to an internist for examination, especially as to her endocrine secretions.

His diagnosis was (1) general arteriosclerosis; (2) hypopituitarism, posterior lobe, with hypothyroidism; (3) hypertension (systolic 195). He prescribed thyroid gland, and pituitary substance (entire gland). After two months of endocrine treatment he reported that the general endocrine symptoms had improved very materially and her blood pressure had dropped from 195 to 150 systolic. The swelling of the lids soon disappeared with the improvement of the other symptoms.

CASE II: Mrs. B. Y., consulted me in November, 1920, stating that the past four days eyelids have been swollen. There was considerable edema of both upper and lower lids of both eyes, it being worse on the left side where the swelling extended over the malar bone. The skin seemed stiff and

leathery, not pitting on pressure. There seemed to be a slight dermatitis, yet hardly sufficient to produce so much swelling. She also had a conjunctivitis. I gave her some drops for this and a lotion for the swollen lids. As the condition had not improved any after several days, but was rather worse, she was referred to a dermatologist who treated her for some time with no improvement. An examination by a rhinologist showed no condition in the nose that could be responsible for the trouble. The urine was found to be normal.

She was referred to an internist who found that she had marked hypothyroidism. Under treatment of this condition the swelling of the lids, which had persisted several weeks in spite of local treatment, very quickly subsided.

In cases of edema of the eyelids, when searching for the cause, aside from any local causes which might be responsible for the condition, we think of involvement of the kidneys, chronic arsenical poisoning and trichinosis. It would seem advisable to keep hypothyroidism in mind also as a possible etiologic factor in these cases.

#### **Pigmentation of Conjunctiva of Lids.**

DR. W. A. SHOEMAKER presented case reports as follows: Mrs. S., aged 61, consulted me in May, 1919, on account of poor vision for distance and for reading, and on account of some burning of the lids.

The ophthalmoscope revealed incipient cataract in both eyes. The burning of which she complained was due to a chronic catarrhal conjunctivitis. Blood pressure and urine normal. General health good. Lenses were prescribed, and she was given a zinc and boric acid solution for her conjunctivitis.

In September, 1920, she reported that recently her eyes had been watering, felt rough and were sensitive to light. Upon everting her lids the palpebral conjunctiva which had been perfectly smooth was found to be thickly dotted with small blackish deposits, only a little of which could be rubbed off. A zinc sulphat and boric acid solution was again prescribed. On October 18th the deposits were more numerous and more prominent. The

conjunctiva looked as if black pepper had been sprinkled on it. On November 5th, under cocain, the lids were thoroly rubbed with cotton pledgets dipped in 1/5000 bichlorid of mercury solution. Most of the deposits were removed by this procedure. A piece of pigmented conjunctiva was excised and it with some of the separated pigment, was given to Dr. Buhman, the pathologist, for examination.

Boric acid ointment, 15 gr. to the ounce of white vaselin, was freely applied and the eyes bandaged. The same treatment was applied daily for three days. On the fourth day she was allowed to go home, with instructions to use white silver (Hille) three times daily. Two weeks later she reported that her lids no longer felt rough, did not water and her eyes were no longer sensitive to light. The conjunctiva was looking very much better but there was still a good deal of pigment below the surface.

The same treatment was continued and on January 6, 1921, she reported that her eyes had been feeling perfectly comfortable. Only a few pigment spots were left on the conjunctiva; in the right there were quite a number, but none on the surface.

Ten months later she reported that she had used the white silver for one month and since that time had used nothing, as her eyes felt perfectly comfortable. Only a few very small pigment spots could be seen and the conjunctiva was smooth.

Dr. Buhman's report is as follows:

"Sections from the specimen submitted show some edema, a rather large amount of lymphocytic and some leucocytic infiltration. There is some yellowish brown granular pigment present in several areas. This pigment seems to be extracellular and is no doubt blood pigment. Cultures of the pigment on blood serum causes liquefaction of the media. The organism was, in pure culture, a long fat bacillus, gram positive, actively motile in young culture and proved to be the bacillus subtilis." The pigment under the microscope is a blackish brown amorphous looking substance.

### Serous Cyclitis Caused by Diseased Teeth.

DR. W. A. SHOEMAKER reported on A. T. C., aged 22. November 11th gave the following history:

Seven years ago the right eye had an attack of iritis which lasted several weeks and promptly subsided after the extraction of a tooth. Last June he developed an iritis in his left eye which also promptly got well after having a tooth extracted. On October 19th the left iris again inflamed.

On November 2nd he had severe serous cyclitis, with moderate iritis; upper lid edematous, marked lachrymation and photophobia. The eye was extremely sensitive to touch over the upper ciliary region and there was a marked descemetitis. The vitreous was somewhat hazy but no exudates were discovered. Pupil widely dilated. An X-ray of the teeth showed a diseased upper left bicuspid which was removed. Wassermann negative, Iodid of potassium and bichlorid of mercury were prescribed. Hot applications were ordered and the pupil was kept widely dilated with atropin.

November 5th the eye showed decided signs of improvement. November 11th it was less sensitive to light, ciliary injection was less marked and he had no pain. November 19th there was very little ciliary injection, the descemetitis was clearing and his vision, with correction, was 22/30. The vitreous was apparently clear. The acuity of vision was no doubt lessened by the descemetitis still present.

Mrs. W. S., aged 30, came November 23, 1920. For the last four days her eye had been sore and sensitive to light. Examination revealed decided ciliary injection with a very sensitive spot in the ciliary region under the upper lid. The iris reacted promptly to light and convergence. The pupil dilated promptly with a drop of atropin. There was a marked descemetitis. Vitreous fairly clear, no exudates. Wassermann negative; dental roentgenograph showed an apical abscess of the upper molar, upper left bicuspid and lower left first molar. These teeth were extracted. The pupil was kept dilated with atropin and hot applications were made. Bichlorid of mer-

cury and iodalbin were given internally. November 30th the tender spot in the ciliary region and the ciliary injection had disappeared. Decemetitis less marked. December 23rd, no trace of descemetitis, vitreous clear, no exudates and vision is normal.

September 24, 1921, she reported that for the last five days her right eye had been sore to the touch and a little bloodshot, and that vision was somewhat blurred. Examination revealed a tender spot in the ciliary region, ciliary injection, and an active pupil. A diagnosis of serous cyclitis was made. She was put on the same treatment as in the previous attack. Another X-ray picture showed so many diseased teeth that her dentist advised having them all removed. After the teeth were removed the eye steadily improved and by October 19th was normal.

JOHN GREEN, JR.,  
Editor.

# NASHVILLE ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY.

FEBRUARY 20, 1922.

DR. HILLIARD WOOD, PRESIDENT.

## Intraocular Hemorrhage Following Vaccination.

DR. E. L. ROBERTS presented a girl, R. H. aet. 10, with internal strabismus of the left eye; vision never better than 20/200. Four years ago he fitted the patient with proper glasses. One month ago the patient was vaccinated, and as the arm became sore, a very similar sore developed on the left, lower lid; the cornea became somewhat hazy; and anterior chamber filled with blood. Tension slightly subnormal. Present vision only perception of light.

*Discussion.*—DR. E. B. CAYCE.—In all cases of doubtful diagnosis a Wassermann is always in order, and one should be made in this case, as it might possibly throw some light on the condition. This case was one in which, in the beginning, there was a strong indication for the injection of the cyanid of mercury, as the important thing is to get absorption at the earliest possible

moment, and such absorption is most readily promoted by a violent reaction of the eye.

DR. GEO. H. PRICE.—Had there been a very marked reaction or inflammation about the eye, with patient sick from the vaccination, there might be some connection between the two; but in the absence of such symptoms the occurrence of the hemorrhage at this time was purely accidental. He suggested, however, the possibility of the patient's having scratched the arm, and then the eye or lid, thus carrying infection.

DR. FRED E. HASTY was inclined to the belief that the hemorrhage following vaccination was merely a coincident. He would deal with this as with an eye which had been injured. He would advise clearing up all possible foci of infection, even in the presence of a strongly positive Wassermann, as he believes that many mistakes are made in attributing pathology to plus Wassermans and overlooking other contributory causes.

## Intraocular Hemorrhage, Vascular Loop.

DR. E. B. CAYCE presented Mr. F. H. C. aet. 57, traveling salesman. General history irrelevant. September 19, 1920, stooped over suddenly and at once realizing that he had lost vision of left eye. Went to the Vanderbilt Hospital, where his condition was diagnosed as intraocular hemorrhage. General physical examination, including a negative Wassermann made. Urinalysis showed rather high percentage of sugar, which cleared up in a few days under appropriate treatment, and he has been almost entirely free from sugar since.

Dr. Cayce first saw patient February 20, 1922. R. Eye: V. 12/20; field of vision contracted—(See field); beginning optic atrophy. L. Eye: V. nil. Fundus shows typical optic atrophy, with very unusual appearing fundus in one particular, viz., that there is a vein that apparently comes with the central artery and extends towards the nasal side about one-half of the diameter of the nerve head, and then loops back and enters the nerve head at almost the same point. The condition, in his



opinion, is one of the smaller vessels, the enlargement of which has persisted, and it was formed in nature's effort to perfect a collateral circulation. He judges that the condition is not an anomaly from the fact that the other fundus is apparently normal. (See Fig. 1).

Dr. Cayce said that his motive in presenting this case was two-fold: (1)



Fig. 1. Vascular loop in left eye of F. H. C., patient of Dr. Cayce.

to show the unusual condition in the left eye, with beginning similar condition in the right; (2) to show the fundus drawing, which had been made by a local artist who is being trained by him in the use of the ophthalmoscope.

**Discussion.**—DR. HILLIARD WOOD said that in his opinion the formation of this new vessel followed hemorrhage. It impressed him as being one of the types of retinitis proliferans, in which the vessels develop from blood clot, projecting forward in front of the normal plane of the retina, and being hyperopic in their refraction as compared with the general fundus. The few cases he had seen followed hemorrhage, and this impressed him as being one of that type. The fact that the trouble seems to be developing in the other eye would indicate that it is primarily due to diabetes, as there is no history of hemorrhage in the right eye.

DR. GEO. H. PRICE was of the opinion that the condition was merely an anomaly.

### Unusual Sequel of Creasote Burn.

DR. JAMES P. CRAWFORD presented a colored boy, W. H. aet. 19, a pupil in the Tennessee School for the Blind. Eyes claimed to be normal until 6 years ago, when patient was creasoting lumber and dropped a plank into a tank of creasote, the creasote splashing into both eyes. The accident was followed by inflammation and loss of vision of

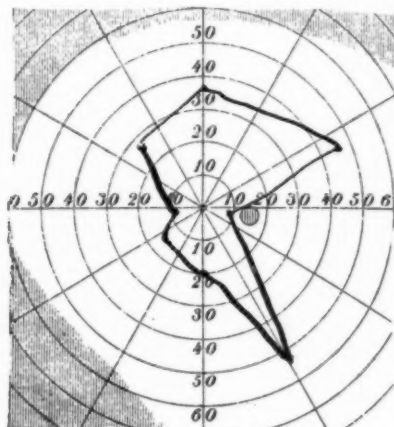


Fig. 2. Field of vision of F. H. C., showing irregular contraction.

each eye. Patient claims his eyes and vision were normal to the time of accident.

Examination shows marked enlargement of each eyeball, the enlargement involving not only the cornea, but the sclera. At first glance it appears to be a case of buphthalmos, but closer examination shows the absence of the anterior chamber in either eye, the iris being adherent to and largely merged with the more or less opaque and scarred cornea. In each eye the cornea protrudes abnormally forward when the eyes are opened, but when closed the lids cover each cornea fairly well. There is no pain; no irritative symptoms; no vision in either eye. Dr Crawford's theory was that the creasote burn produced ulceration of each cornea, which is indicated by the scarring and thinning out of the cornea. In the doctor's opinion there is a question whether this was originally buphthalmos, or whether a pseudobuphthalmos really due to the creasote burn.

**Discussion.**—DR. HILLIARD WOOD said

that the question seemed to be whether this condition was one of staphyloma or buphthalmos. In his opinion buphthalmos seemed to be excluded, as buphthalmos is congenital, and this patient claims to have had good vision until the time of accident. The amalgamation of cornea and iris indicates former ulceration, and not buphthalmos. In the latter condition the anterior chamber is abnormally deep, whereas in the present case it is obliterated.

DR. HERSCHEL EZELL was of the opinion that this was a case of buphthalmos. He believes the patient to be honestly mistaken in his statement that the vision was good up to the time of the accident.

DR. GEO. H. PRICE commented upon the absence of symblepharon, saying that in his opinion a creasote burn sufficient to have produced this amount of pathology would have also produced pathology about the lids, with adhesion between the conjunctiva of the lid and the globe. He said that while he had seen a great many creasote burns, he had never seen one producing corneal ulceration. He looked upon the scar of the cornea as a congenital condition. Regarding the patient's statement that his vision was good previous to the accident, Dr. Price thought that this could not be relied upon, as seeing is relative, and no matter what the degree of vision to which a patient may be accustomed, he believes that he sees as well as others.

## WILLS HOSPITAL OPHTHALMIC SOCIETY.

JANUARY 3, 1922.

DR. BURTON CHANCE, Chairman.

### Interstitial Keratitis.

DR. WILLIAM ZENTMAYER showed a case of interstitial keratitis with nodules at the angle of the anterior chamber, which he considered to be true gummata. Dr. Schwenk thought these might be tuberculous nodules; but that the use of inunctions of mercury was the proper treatment.

### Hemorrhages into Anterior Chamber.

A case of recurrent hemorrhages into the anterior chamber on the service of DR. MCCLUNEY RADCLIFFE was shown.

This case was one of an old iridocyclitis. Dr. Zentmayer stated that he had seen one case of spontaneous hemorrhage in the anterior chamber about twenty years ago but has not seen another since—he thought this condition was due to degenerated blood vessels of the ciliary body from a previous inflammatory condition.

### Bilateral Ptosis.

DR. LOUIS LEHRFELD, reported on Miss R. L. age 14, colored. Noticed drooping of both eyelids but more rapid and extensive of right, for three years. Always had poor vision in right eye, but drooping of lid became so extensive as to completely obstruct vision.

On October 1, 1921, first examination showed a ptosis of right eyelid covering two-thirds of cornea, obstructing view of pupil, left eyelid covered one-third of cornea. There was not a complete paralysis of the levators, as there was a distinct but retarded elevation on superduction. The other extraocular muscles were normal in action in all directions, and pupillary reactions were prompt.

The family history and laboratory tests gave no assistance in determining the etiology. The general physical condition was good and the patient showed a high grade of mentality in comparison to the lethargic physiognomy caused by drooping lids. The skin and subcutaneous tissue appeared to be loose and excessive; and by process of elimination as to cause, a diagnosis of *blepharochalasis* was made.

On October 8, a Tansley-Hunt operation was performed in which a tongue of skin was drawn thru a subcutaneous tunnel under the eyebrow, and was anchored by deep sutures to and beneath the skin of the forehead. As there was a partial ptosis of the left, the suspending lip of skin was not cut very short. Ten days following the operation the sutures were removed. The success of the operation was not at first apparent, but when swelling subsided, there was an elevation parallel with the left lid which has since become stationary in its ptosis and apparently follows the right lid. C. S. O'BRIEN, Secretary.

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JEAN MATTESON, Room 1209, 7 West Madison Street, Chicago, Ill.

## GONOCOCCUS OPHTHALMIA OF EGYPT.

As ophthalmia of the new born infant, infected at birth, and of the adult, usually infected with cocci that have developed in the urethral epithelium, this disease occupies a large place in the literature of ophthalmology and in the thought of the ophthalmologist. The cases that develop under other circumstances, and thru other channels of infection, have not received the attention they deserve. It is well understood that this disease is always dangerous to sight. But not that, comparatively, it is much more dangerous to the adult than to the infant; that of infected adults a much larger proportion become blind under good treatment, than among infants treated as early and as efficiently.

From this point of view the cases that occur in childhood, but not from birth infection, like that reported on p. 371, are of especial interest. They are rare in this country, but in some other parts of the world are very common. The purulent ophthalmia of

Egypt is a gonococcus ophthalmia. The impression to this effect has recently been confirmed by the work of Beaton. (Report of the Director of Ophthalmic Hospitals, p. 403.) Beaton found that the Gram negative diplococci, contained in the purulent discharge from these cases, "differed in no way from the characteristic aspect of gonococci in gonorrheal pus." Under the same conditions and with the same difficulty, they gave colonies having the same appearance, and gave the same reactions, producing acid from glucose but not from maltose. These characters, and still more the conjunctival reaction, the clinical characteristics of the conjunctivitis they cause, identify these organisms as gonococci, and distinguish them from other cocci presenting the same appearance under the microscope, as the micrococcus catarrhalis, the meningococcus, etc.

Of the cases of acute conjunctivitis in Egypt, the gonococcus causes almost as many as all other organisms together, 1657 against 1007 caused by the Koch-Weeks bacillus, 515 by the

Morax-Axenfeld bacillus, 102 by the pneumococcus. To quote, from the report above alluded to, the words of the Director, Dr. A. F. MacCallan:

"There is considerable difference between gonococcal conjunctivitis in Egypt and in Europe. In the first place, the origin of the condition in Egypt is almost invariably the result of contagion acquired from the conjunctival discharge of a neighbor, whereas in Europe it usually has a venereal origin. This does not mean that gonococcal urethritis is uncommon in Egypt. In the second place the gonococcal conjunctivitis met with in Egypt is characterized by the frequency of subacute and chronic forms. Thirdly, there is a definite seasonal variation in the incidence of gonococcal conjunctivitis: increased prevalence being markedly influenced by the rise of atmospheric temperature, which occurs annually in the spring, as shown in my last report. Fourthly, the disease when treated is apparently less destructive than in the cases I remember when house surgeon at the Royal London Ophthalmic Hospital. Whether this is because we treat it more skillfully, or because the gonococcus is less virulent, or because the reputed gonococcus of Egypt is not the gonococcus at all, but another morphologically similar organism, remains to be decided."

The evidence before us seems to indicate that the organism in Egypt is exactly the same as the gonococcus of Europe, altho we are coming to understand that different strains of the same species of bacteria may show differing pathogenic activities. In the new born, the gonococcus yields to treatment in a large proportion of cases, and in Egypt a large part of the cases occur in young children between 1 and 5 years of age (Meyerhoff).

The share which flies take in spreading the disease is still unsettled. The traveler in Egypt who sees them walking undisturbed over the eyes of young children, and apparently unfelt, is struck with a common insensitiveness of the eyes to the contact of foreign bodies, that may play a very important

role in the implantation of the virus from discharging eyes upon those not previously affected. The impression is that flies are a very important factor in the spread of the disease, but more exact knowledge with relation to the particular flies in question is needed. The study of gonococcus conjunctivitis, where it is epidemic, should give material help in dealing with the occasional cases that occur in many parts of the world.

E. J.

#### GRADUATE TEACHING OF OPHTHALMOLOGY.

The attendance upon the courses of lectures given by Prof. Fuchs in various parts of the United States is a new and very striking illustration, of the desire of ophthalmologists to fit themselves as well as possible for their chosen work, and the enthusiasm they feel for all the learning they can get regarding it. An even more spectacular display of this enthusiasm was the gathering of 500 ophthalmologists and oto-laryngologists in Philadelphia in October, for a three days' intensive course of lectures and demonstrations in connection with the meeting of the American Academy of Ophthalmology and Oto-Laryngology.

But there are other manifestations of this spirit. For more than a year the Colorado Ophthalmological Society has held, on the day of each of its meetings, a series of demonstrations that have been attended regularly by most of its members; and among the best appreciated have been those on the normal and pathologic histology of the eye. The Pacific Coast Oto-Ophthalmological Society had clinical and other demonstrations in connection with its last annual meeting. The Kansas City Eye, Ear, Nose and Throat Society has arranged operative teaching clinics, that have been very popular. The attendance on the summer course in the University of Colorado has increased, until it has about reached the limit that institution can provide for in its present quarters. The University of Pennsylvania was unable to accept



all who desired to take its graduate course in ophthalmology, lasting thru the year.

There can be no doubt, that only the difficulty of leaving practice for long periods prevents many competent practitioners of ophthalmology from making themselves more competent, by courses of study carried on with the assistance that skilful demonstrators and lecturers can give. Every effort should be made to carry this kind of help to the mass of ophthalmic practitioners, and especially to those who practice alone in the smaller cities and towns, where there is no assistant and no other specialist to whom patients might be referred, during any considerable absence in pursuit of graduate study.

A three days' intensive course in connection with an annual meeting may be helpful and inspiring; but it would have to be repeated for a hundred years to furnish the equivalent of one year devoted to graduate study. Prof. Fuchs' lectures have been most valuable to those who could attend them. But he had invitations to give his course other places, which he could not accept; and not one-tenth of the ophthalmologists of the United States will be able to hear them.

The opportunities for graduate study of ophthalmology must be placed on a broader basis, to meet the need of the time. There are many medical schools in which short courses of training could be given on special subjects, if the need for it were more widely understood and insisted on. There are probably a hundred ophthalmologists in this country each capable of studying a particular topic or branch of ophthalmology, until he could give one or more very interesting and instructive lectures upon it. These lectures could be repeated at many points, wherever there might be a group of ophthalmologists gathered to hear them. They should be given on a basis of adequate compensation. But a part of that compensation would be the satisfaction of teaching, and the increased respect of one's colleagues that always arises when such work is well done.

The practical thing to do is to pick out some subject you would like to know more about. Study it in every way you can and arrange systematically what you learn. Write out what you would say in explaining the facts; then do some more studying about them, and again write down what you think would make them clear. Get up, by photography and drawings, either by yourself or by the help of others, all the diagrams and pictures that would help make your views easily understood. Offer your material first as a paper or address before some society, and if you have put the right work into it, other opportunities to use it will arise. Even a single demonstration or lecture, carefully worked up, can be made a real service to your profession.

E. J.

### A NEW JOURNAL

A recognition of the difference between science and trade seems to be extending among the optometrists. The Keystone Publishing Co., for many years the publishers of *THE KEYSTONE*, have undertaken the publication quarterly of *THE ARCHIVES OF OPTOMETRY*. According to the Editor: "Optometry today is a recognized branch of general science; the practice of optometry, a professional vocation of comparatively definite nature. Today's duty is to perfect the science, improve the practice and determine more exactly the scope and character of what shall be properly comprehended in this science and practice. At this stage of development, a scientific journal is essential to the advancement of that ideal now taking definite shape in the mind of the forward looking optometrist."

The first number, bearing the date of January, 1922, is a neat attractive looking journal of 56 pages, printed in large clear type, with illustrations. The articles are such as will appeal to and serve the optometrist. They are arranged under the headings, Original Papers, Editorials, Diagnosis and Treatment, Book Reviews, Abstracts and Notes. The advertisements are confined to advertising pages.

The subjects of the original papers are: Development of Visual Acuity and Ocular Dynamics; The Object of Ocular Calisthenics; Anomalous Accommodation; Test Chart Usable with or without Distance Doubling Mirror (using only letters that are laterally symmetric); and Significance of Exophoria at Reading Points in Presbyopia.

E. J.

### BOOK NOTICES

**Papers to Be Presented Before An International Congress of Ophthalmology.** Washington, D. C., April 25-28, 1922. Octavo, 522 pages, illustrated. Philadelphia, 1922.

More than anything else that has yet transpired, this volume gives substance and reality to the Washington Congress, that will have been held and passed into history before this reaches our readers. It has been printed in excellent form and reflects great credit on the committee that published it. Their names do not appear in the volume, but they are William Zentmayer and William E. Sweet of Philadelphia and Arnold Knapp of New York. Dr. Zentmayer and also Sweet, on whom the chief burden of editing the volume fell, especially deserve to have it known who has done this good work for the ophthalmologists of the United States.

Of these papers there are 40 from the following countries; Sweden, Belgium, Jugo-Slavia, Tunis, Chile, Peru, Cuba and Canada each 1, Mexico 2, France and Spain each 5, England 7, and the United States of America 13. In addition, there are 3 propositions to be laid before the Congress for its endorsement. The series of 4 formal addresses, about 20 demonstrations, and the entertainments that will occupy part of the time of the Congress are not mentioned. Altho certain nations are conspicuous by their absence from this list, it is as widely representative of the nations of the world as any International Congress that has ever been held. On account of the large number of papers offered nearly as many had to be declined as could be accepted,

and from the United States more than two-thirds had to be declined.

Of these papers, 7 are published in French, 7 in Spanish and the remainder in English; several of the French writers, and several from other European countries and from Latin America having chosen to write in English. It has always been the case with preceding international congresses and rightly so, that the bulk of the papers were written in the language of the country in which the congress was held; and with which the largest proportion of members were most familiar.

Comparison with the pre-session volumes of other international congresses is entirely favorable to this one. It has a table of contents, an index of authors, is better printed and bound; and includes all the papers to be presented, not merely a few that have been sent in early, and were too long to be gotten before the members of the congress in any other way. Of course, the final transactions of the Congress will contain in addition to these papers, the discussions they elicit, the formal addresses, some account of the demonstrations given, minutes, lists of officers, committees, etc.

E. J.

**Seventh Annual Report, Ophthalmic Section, Department of Public Health, Egypt.** By A. F. MacCallan, Director of Ophthalmic Hospitals. Quarto, 54 pages, with tables and graphs. Cairo Government Press. 1920.

The form of this book, with its page of 8 by 13 inches, is well suited to printing extended tables, and large graphs which present masses of statistics and general relations of epidemics at a glance; but it is an inconvenient size to place with other books upon library shelves. The greater part of its matter is statistical and printed in these forms, but there are some very interesting facts set forth in the text, in the Historical and Clinical Section.

The importance of gonococcus conjunctivitis in Egypt has elsewhere been alluded to (p. 400). Glaucoma is also a very important disease and cause of blindness in Egypt: 2,715 cases of prim-

any glaucoma were examined, and 450 trephinations and 299 iridectomies were done for it. The total of glaucoma cases seen in six years amounted to 12,341 among 516,430 patients, 2.39 per cent.; and the majority of these, 1.51 per cent., were cases of absolute glaucoma. Optic atrophy, too, is an important cause of blindness: 136 cases were encountered. Of cataract there were 1498 cases, but so many were complicated by corneal opacities, that only 364 came to extraction. The extraction was with iridectomy, which was preliminary in 10 cases.

The pathologic report includes 242 eyes sectioned, 44 for tumors, of which 29 were malignant. The section on ophthalmic treatment in the schools seems to show that trachoma is becoming less prevalent. Of serious cases treated in their first year of school, the percentage had declined in three years from 45.5 to 32.2; and in 1919-20, the percentages were in the second school year 14.8, in the third 8.5, and in the fourth 7.6. But of school children inspected, an enormous number showed evidences of active or past trachoma; of 2910 in eleven localities, over 90 per cent. The percentage varied from 83.4 to 99.1.

The different publications of this ophthalmic section are of considerable importance. They include: Annual Reports on Ophthalmic Hospitals 7; Bulletins of the Ophthalmological Society of Egypt 13; and 7 occasional papers and monographs. Dr. MacCallan is to be congratulated on the ophthalmic achievements of this section in Egypt, under his administration. The profession needs to be reminded how much helpful information is coming from this source.

E. J.

#### **The Phoropter, Henry L. de Zeng.**

Small octavo, 120 pages, 59 illustrations. Published by the author, Camden, N. J., 1922.

This book frankly indicates in its name its relation to the instrument which it describes and brings to the attention of its readers. Beyond this the preface states: "If this book contributes in any degree to a clearer un-

derstanding of the importance of testing the ocular muscles and of the possibilities of great good to be accomplished thru the systematic making of such tests, the object of the work will have been attained."

The first three chapters deal with "The Evolution of Eye Testing," "The Motor Muscles," and "The Basis of Muscle Testing." Then follow the descriptions of the instrument as a whole and of the different "units" that it includes; and the methods of their use in testing and exercising the ocular movements. Chapter XX is devoted to "General Definitions of Scientific Terms," and Chapter XXI to "Scientific Data Frequently Used." In the latter are given tables of focal lengths, prism values, prismatic effects of deccentration of spherical lenses, the transposition of cylinders, and accommodation at different ages.

The book is very clearly written, without the use of unnecessary words. It is exceptionally free from the introduction of extraneous matter for the purpose of making a larger volume. Except for a few such expressions as "motor muscles," the language is excellent. The absence of an index is a defect, but not so important here as in works of reference. The type is large, the illustrations clear, the printing and paper excellent.

E. J.

### **CORRESPONDENCE.**

#### **The International Congress.**

##### *To Our Readers:*

It is not possible to give, to those who did not attend it, the best of the Washington International Congress of Ophthalmology—the personal contacts with great workers in our branch of science. But some impressions of those who came to us from abroad, as well as some of the main features of this notable gathering, are worth preserving in this form, as they will not be found in the scientific proceedings which will appear later.

The fire which destroyed the upper story of the New Willard Hotel, Sunday morning, after some of the members had arrived, furnished a vivid

experience for them, altho it was marked by absence of panic or disorder. It involved the finding of new halls for the General Sessions of the Congress, and for the Commercial Exhibit. But before noon on that day, these had been secured and offers of most valuable assistance were received from the Trustees of the Corcoran Art Gallery, and other institutions; so that the smoothness of the arrangements was but little interfered with. The Commercial Exhibit was opened in the Washington Hotel, at the other end of the same block, and most of the meetings were held in the beautiful Continental Hall of the Daughters of the American Revolution, a few minutes' walk from the hotels, across the splendid park south of the White House. Registration was carried on in the Gridiron Room, at the New Willard, where most of the guests remained as tho nothing serious had occurred.

When the meeting assembled at 9:30 Tuesday morning, the Vice-president of the United States was already waiting in the building to extend the official greeting of the National Government to the distinguished foreign guests, who had come in response to the invitation sent out nearly two years ago thru the Diplomatic Service of the State Department. Next day President Harding received the members of the Congress at the White House, with the smile and hand grasp for which he will be long and widely remembered.

Tuesday afternoon was given to the visit to Mt. Vernon. That day, and thruout the week, the weather was of the kind that makes Washington a most delightful place to visit at this time of the year. Tuesday evening the reception, given to the members of the Congress by the Directors of the Corcoran Art Gallery, gave ample opportunity for those who had know each other only by name to become better acquainted. The background of the beautiful building, with its great collection of paintings, and the atmosphere of music and good feeling, furnished most favorable conditions for the social enjoyment of the occasion.

The wives of Prof. Barraquer of Barcelona, Dr. Otto Roelofs of Amsterdam, Prof. Whitnall, and Dr. Tooke of Montreal, and the wives and daughters of many of the American members added to the spirit and interest of the occasion.

Shortly after the opening of the Congress the nominating committee presented the list of officers for the Congress; which was supplemented at later sessions, as representatives of other countries presented their credentials. The officers chosen were as follows:

#### *President*

Dr. G. E. de Schweinitz, of Philadelphia, Pa.

#### *Vice-Presidents*

Dr. T. M. Li, of China.

Dr. C. E. Finlay, of Cuba.

Dr. Francisco J. Soriana, of Argentine.

Dr. Caesario de Andrade, of Brazil.

Prof. Emile Gallemaerts, of Belgium.

Dr. Pimental Franco, of Brazil.

Prof. F. de Lapersonne, of France.

E. Treacher Collins, F. R. C. S., of England.

Prof. H. S. Rochat, of Holland.

Dr. Aurelia Beruan, of Peru.

Dr. George Mackay, of Scotland.

Dr. D. Francisco Poyales, of Spain.

Prof. I. Barraquer, of Spain.

Dr. William Z. Hons, of Czechoslovakia.

Prof. Alvar Gullstrand, of Sweden.

Dr. Santos Dominici, of Venezuela.

Dr. Salvatore Floria, of Italy.

Dr. Lucian Howe, of Buffalo, N. Y.

Dr. Edward Jackson, of Denver, Colorado.

#### *Secretary-Treasurer*

Dr. Luther C. Peter, of Philadelphia, Pa.

#### *Secretaries*

Dr. Albert Lasalle, Montreal, Canada, *French-English*.

Dr. Francisco M. Fernandez, Havana, Cuba, *Spanish-English*.

Dr. Jesus M. Penichet, Havana, Cuba, *French-Spanish*.

The total number who joined the Congress is about 1100. Of these 600 registered at Washington; and the members of their families and visitors swelled the total to between 800 and



900 in attendance. Of these 25 members came from Canada, five each from Cuba and Great Britain, France and Spain each three, Mexico, Holland and Sweden each two, and seven other nations one each; making 54 foreign members and 17 different nations represented at the Congress. From three other countries came papers, whose authors could not be present.

The difficulties of language were not so great as might have been anticipated. Many visitors, like Dr. Li of China, and Prof. Finlay of Cuba spoke excellent English. Prof. Barraquer and Prof. Poyales, altho speaking mostly in Spanish, spoke also in faultless French. Prof. de Lapersonne, always using French, spoke so slowly and distinctly that those who had a very imperfect comprehension of the language could still follow his remarks. His colleagues spoke English, as did all the members from Sweden, Holland and Belgium. Listening to an unfamiliar language is not so bad as straining to catch the words of a speaker who does not speak loud enough; for there are many words relating to ophthalmology that are common to most of these languages, and the abstract in the program, printed in each official language, helped each hearer to follow the presentation of any paper. Then there is expression by gesture, in which the Latin races excel, and in which Prof. Barraquer is an adept. By that means alone one could almost follow the steps of his operation, as he described it. Important announcements were repeated by the French and Spanish secretaries, who also translated the substance of remarks in discussion for those authors who could not glean for themselves the points made by various speakers, who discussed their papers.

The foreign members, who made comparisons with other congresses of ophthalmology, were all favorable to this for the excellence of the arrangements and the high scientific value of the discussions. Each session completed the program arranged for it, yet found therein enough to fill the time allotted. There were numerous flashes of humor that brought spontaneous

laughter; but the clash of ideas, altho very distinct, never developed feeling that caused an awkward or unpleasant situation. Col. Elliot, speaking of the Barraquer operation, warned young men to stick to more familiar and less difficult methods. He stated if he had a cataract he would have it extracted with capsulotomy, after preliminary iridectomy, and followed by secondary operation if need be. After this it was startling to hear Prof. Barraquer say in French, "As I could not operate on myself, so would I." This discussion also brought out the immediate results of Prof. Barraquer's operations, in the last two weeks, at Boston, New York, Philadelphia, and Richmond. After some less favorable cases in the places first named, he had done at the last two cities 23 consecutive intracapsular extractions with loss of but a drop of vitreous in one case, and good vision restored in all.

The different demonstrations, given mostly at the Army Medical Museum, excited great interest. The "point-olite" demonstration of Prof. Gullstrand opened a new era in the use of focal illumination. Sir William Lister's lantern slides shown by Mr. Collins, brought out essential points in the structure of the vitreous. The lantern slides of Magitot, obtained from stained sections by the Lumiere process, under strong illumination gave beautiful pictures. Nordenson's demonstrations of fundus photography are the first in America. Balbuena's modification of the method of silver staining sections of nerve tissue has given some of the finest microscopic slides of the retina, optic radiations and other parts of the central nervous system ever placed under the microscope. The exhibit of Verhoeff could not be duplicated anywhere in the world. Prof. Guyer's rabbits showed the latest results in the study of the heredity of eye defects. The collection of books in the Library of the Surgeon General's Office gave the opportunity of a lifetime to see the most famous of the old books on ophthalmology. Full descriptions of various exhibits could do little more than tell those who did not see these demonstrations how much they missed.

Propositions looking to formal action on the part of the Congress were referred, without discussion, to a committee; which later reported that it was impossible at this time to give adequate consideration to the suggestions offered, so as to arrive at conclusions that could be recommended to the Congress for adoption; and advised that the various subcommittees appointed to consider them be authorized to add to their number and report to the ophthalmic journals and to a subsequent Congress of Ophthalmology. The committees named were as follows:

*Letters and characters for visual tests*

Dr. Edward Jackson, Denver, Colo.

Dr. A. E. Ewing, St. Louis, Mo.

Dr. G. F. Rochat, Groningen, Holland.

*Standards for field taking*

Dr. Robert H. Elliot, London, England.

Dr. Luther C. Peter, Philadelphia, Pa.

Dr. L. Magitot, Paris, France.

Prof. C. E. Ferree, Bryn Mawr, Pa.

*Anatomic versus ophthalmic nomenclature*

Dr. M. Uribe Troncoso, New York City.

Dr. M. Feingold, New Orleans, La.

Dr. J. W. Nordenson, Stockholm, Sweden.

At the business session on Friday, Mr. E. Treacher Collins, on behalf of the Council of the Ophthalmological Society of the United Kingdom, and the societies affiliated with it, extended an invitation to an *Ophthalmological Congress to be held in London in 1925*. Prof. Gallemaerts presented an invitation for the holding of an International Congress of Ophthalmology in Brussels. The thanks of the Congress were tendered for the latter invitation; but it was not accepted, altho as the president pointed out the disposition of the Congress was to give Belgium anything she asked for. Prof. Gullstrand, pointing out his own strictly neutral position during the Great War, moved the acceptance of the invitation extended thru Mr. Collins, with expression of the wish that German should be one

of the official languages at that Congress. Prof. Lucien Howe supported this motion; and demonstrated by speaking in German that it was in no way "boycotted" at the Washington Congress. Altho some of the members present refrained from voting on it, the motion to accept the invitation to London in 1925, with the suggestion that German should be one of the official languages, was adopted without a dissenting vote.

The dinner, given by the American members of the Congress to those from other countries, took place at the New Willard, Friday at 8:00 p. m. The president of the Congress, acting as toastmaster, called in brief, appropriate sentences upon the following, who spoke in response for the countries and organizations they respectively represented, in such brief and pointed remarks that in spite of the number of speakers, the meeting was neither unduly protracted nor wearisome.

Prof. F. de Lapersonne for France, Mr. E. Treacher Collins for England, Dr. Carlos E. Finlay for Cuba, Dr. T. M. Li for China, Dr. H. S. Rochat for Holland, Prof. Alvar Gullstrand for Sweden, Prof. E. Gallemaerts for Belgium, Dr. George Mackay for Scotland, Dr. Salvatore Floria for Italy, Dr. D. Francisco Poyales for Spain, Dr. William L. Hons for Czecho-Slovakia, Dr. Walter R. Parker for the United States of America. Prof. Igancio Barraquer of the University of Barcelona, Surgeons General M. W. Ireland for the U. S. Army, E. R. Stitt for the U. S. Navy and H. S. Cummings for the U. S. Public Health Service, and Dr. W. H. Wilmer for the Committee of Arrangements were also called upon and spoke. The meeting concluded with most hearty expressions of mutual respect and good feeling.

It has been demonstrated that the ophthalmologists of the world can hold a very successful congress, even in the face of some disaffection and active opposition. There is every reason to hope that three years hence these unfavorable influences will have ceased their activity, and that the London Congress will be an even greater success.

E. J.

## ABSTRACTS

**Baldino, S. Relation Between Visual Acuity and Size of Globe.** Arch. di Ottal. v. 27, 1920, p. 212-220.

All oculists see eyes showing no pathology which are emmetropic, or with equal degrees of refractive error, and still showing a great difference in visual acuity. The author takes up the question whether differences in the size of the globe may account for this. The size of the retinal image varies proportionately as the length of the eye. In every eye, this would cover an equal number of retinal elements and the visual acuity would be the same. The other factor which would affect visual acuity is clearness. The author apparently approves that conjugate foci of the retina are not proportionate to the length of the eye when viewing the same object at different distances. Hence, tho the retinal images cover an equal number of rods and cones, their diffusion circles do not, so that clearness of the image will vary with eyes of different lengths.

A deduction from this is that the present system of recording vision is purely empiric and a certain distance for recording vision should be established for different cases, proportioned to the size of the globe.

S. R. G.

**Rasmussen, Christian. End Results of Strabismus Operations.** Transactions Dansk Oftalmologisk Selskab. p. 1, 1922.

Out of 271 patients operated on for squint at the Eye Clinic of the Copenhagen Kommunehospital, from 1905 to 1920, the author has examined 101 patients and determined the final results. During this period the Eye Clinic has had the same chief and has been following a uniform technic. The basic idea in the technic has been to cause the least possible trauma to the conjunctiva and other structures.

Advancement has been done in the following manner: Prince's forceps is used in holding the tendon. The suture for advancement is armed with three needles, one in the middle of the

thread; this needle is brought thru the tendon and conjunctiva from behind. The two ends are passed under the conjunctiva and brought out at the edge of the cornea in the central vertical line, one below and the other above the cornea. The two sutures are tied simultaneously with the eye turned toward the muscle to be advanced. The conjunctiva now lies in a fold at the edge of the cornea. After advancement with tenotomy both eyes are bandaged for 5 days, then one eye. The suture is removed in 10 days, and the patient kept in bed until the suture is removed.

Of the 101 patients reported, 54 had been operated with single tenotomy, 14 with double tenotomy, 1 with advancement alone, 23 with advancement and tenotomy, and 9 with multiple operations. Of 68 cases of convergent strabismus operated with single or double tenotomy, 5 showed improvement but still a remaining convergence of 10° or over, 56 below 10° or none, and 7 secondary divergence. Of 23 convergent strabismus cases operated with tenotomy and advancement and with multiple operations, 3 showed a remaining convergence of 10° or over; 13 below 10° or none, and 4 secondary divergence. Of cases which still showed a convergence immediately after operation, 38 to 40% presented improvement at the time of examination, while the cases of divergence had become more divergent. Of 12 cases of divergence operated, 5 were successful, 6 showed 10° or less and one presented secondary convergence.

**Thacker Neville, W. S. Trachoma at Mukden.** China Medical Journal, 1921, v. 35, p. 128.

With an experience similar to other ophthalmologists in China, Neville finds that the chief disease of his eye clinic is trachoma. 1023, or 45% of his 2287 patients had this disease, and 74% of these had the following complications: corneal ulcer 186, pannus 183, corneal scars 109, corneal infiltration 154, entropion or trichiasis 117, atrophy of conjunctiva 3, hypertrophy of car-

uncle 2, and massive conjunctival hypertrophy 1.

He prefers Heisrath's operation for excision of the tarsus for cases of entropion with a thick tarsus to other surgical procedures. For symblepharon he failed until adopting Hay's operation as done for contracted socket. For ulcers of the cornea he uses, instead of hot fomentations, Japanese snuff warmers, which the patient applies three times a day himself.

H. J. H.

**Depas. Amaurosis Provoked by Lightning.** *La Clinique Ophthalmologique*, p. 63.

The author calls attention to the voluminous contribution to this subject by Van Lint which was read before the Ophthalmic Society of Belgium in 1909. He adds a case report: A young woman of twenty years, while standing in front of a window immediately after lightning occurred, could see only enough to get to a chair. The sign of great importance was the terrific blepharospasm which was increased when exposed to the light. It necessitated the use of a bandage over the eyes for a few days. On the second day there was a hyperemia of the conjunctiva and some conjunctivitis for a few days demanding the use of zinc drops. The pupils were contracted. The fundi were normal.

He considers the case from the hysteric standpoint to the conclusion that in his case hysteria does not account for the condition.

T. J. DIMITRY.

**Wick, W. Bilateral Phlegmon of the Orbit and Septic Thrombosis of Cavernous Sinus.** *Klin. M. f. Augenh.* v. 65, p. 335.

A man, aged 28, noticed a small red painful swelling of the skin of the right lower lid without known cause. On the following night intense pain, headache, nausea, with swelling of the conjunctiva and exophthalmos. At his admission into the hospital these symptoms were increased. Several conjunctival vessels were thrombosed, perfect immobility of the swollen lids

and the exophthalmic globe. The palpebral fissure could not be closed. Cornea slightly opaque, pupil medium sized without reaction. Ophthalmoscopically intense congestion, fundus greyish red, disc not discernible except from the course of the vessels. Arteries narrow, veins tortuous and expanded, ensheathed by grey bands, some hemorrhages. No perception of light. The left eye also showed edema of the lids and conjunctiva, and exophthalmos, media clear, veins enlarged and tortuous. Rhinologic examination negative.

**Diagnosis:** Bilateral septic thrombosis of the cavernous sinus. Treatment, incision at the right upper and lower orbital margins, and detachment of the periorbit to the optic foramen. After transient improvement there occurred increased disturbances of consciousness, so that the whole right orbit was exenterated the next morning. No hemorrhages. Increase of the left exophthalmos. Loss of consciousness, and death occurred 78 hours after the beginning of the disease.

The orbital tissue and muscles contained numerous extensive foci of round cell infiltration around the veins. At some places the walls of the veins were perforated and the thrombotic masses spread into the surrounding tissue; in some abscesses and numerous staphylococci. The whole optic nerve showed dense infiltration with round cells. The propagation of the thrombophlebitis to the cavernous sinus was easily demonstrable. The transmission from one orbit to the other does not always take place thru the cavernous sinus, but may occur thru transverse anastomosis between the frontal and ethmoidal veins. Lungs and kidneys presented numerous embolic abscesses.

C. Z.

**Meesmann, A. Pigmentation of the Corneal Limbus in Addison's Disease.** *Klin. M. f. Augenh.* v. 65, p. 316.

Meesmann described 2 cases. The first in a man aged 31, affected with Addison's disease, altho the blood pressure was not diminished, showed marked brown color of the eyelids and



surroundings, yellowish brown ocular conjunctiva in the interpalpebral zone, according to its exposure to light. The corneal limbus of both eyes was of brownish black color 2 mm. in width, extending over the cornea. This ring consisted, as shown under the corneal microscope and slit lamp, of distinct dots arranged in single complexes, which M. thinks corresponded to single epithelial cells. The surface of the epithelium appeared intact, the pigment occupying the deeper strata. Towards the periphery a system of radial cylindrical canals of lymphatic vessels was visible. Their walls were sharply defined by a dense streak of pigment of fine granulation. Toward the cornea a more narrow ramified and anastomosing system of canals could be followed up as far as the inner border of the pigment ring.

The pigment could not be of uveal origin because there were no disseminations of pigment in the stroma of the iris, and the transits of the blood vessels thru the sclera were free from pigment. Above all, the further course showed a partial disappearance of the pigment analogous to the decrease of general pigmentation. The behavior of the lymphocytes corresponded to the anatomically proven absorption or destruction of the pigment in the skin. The author concludes that the abnormal pigmentation in the eye, in lacking function of the suprarenal glands and probably also in some other general affection which lead to hyperpigmentation of the skin and mucous membrane, is limited to ectodermal structures (epithelium of cornea and conjunctiva). The examination with the slit lamp speaks for the origin of the pigment in the epithelial cells in these cases. In the condition of the lymphatics, a still florid process is recognized and thus a differential diagnostic symptom is given for the distinction from other congenital or acquired but little variable, pigmentation. C. Z.

**Asmus, E. Tattooing of Clear Cornea.** Klin. M. f. Augenh. v. 66, 1921, p. 121.

Asmus employed with very good re-

sults in 2 cases of clear cornea and in one with partial opacity, the tattooing method of Hesse to cover a disfiguring complicated cataract. A flap of the cornea, marked with von Hippel's trephine, is dissected and the India ink placed under it.

C. Z.

**Kooy, J. M. Virus of Febrile Herpes.** Klin. M. f. Augenh. v. 66, 1921, p. 75.

Kooy confirmed the experiments of Loewenstein of transmission of the virus of febrile herpes. He inoculated the cornea of rabbits with herpes, material of herpetic, dendritic keratitis, herpes labialis in febrile diseases and one after milk injection. The cultures, morphology, and staining are described in detail. In 22 out of 25 inoculations of herpes material of different origins, a polymorphous microorganism was obtained in the culture and classed under mycobacteriaceae. Three times a culture was grown directly from herpes labialis. In generally affected animals, the microorganism could be isolated 3 times from the blood and spleen, and the splenic pulp yielded positive inoculations. Generally several forms were encountered in the cultures, now and then a clear culture of one, which by cultivation could be converted into other forms. In smears of conjunctival secretions and corneal infiltrations, the various forms could be seen. The microorganism grows well at 37°, better aerobic than anaerobic. It is mainly gram negative. The culture, as well as the original material, could be passed from the cornea of one rabbit to that of others. The virulence was long preserved and was active after 10 weeks. C. Z.

**Niederegger, E. Rare Congenital Anomalies of the Iris; Slit Pupils and Corectopia.** Klin. M. f. Augenh. v. 64, p. 811.

Niederegger describes a congenital ectopia of the slit shaped pupil of the right eye of a man, aged 31, and an ectopia of the left pupil, the slit shape of which ordinarily was slight, but became pronounced upon strong illumination. So far only 14 cases of slit shaped pupils have been published,

which showed a frequent concurrence with corectopia.

From the anatomic and clinical investigations of ectopia of the pupil two groups are distinguished: 1, Unequal growth of the iris without demonstrable mechanical impediment; 2, Abnormal formation of strands. This was the case in N's. patient. The peculiar, tense, fibrillar tissue in the right pupillary area showed a great resemblance to the degenerated pupillary membrane and its processes, coursing in the shape of bands to the sinus of the anterior chamber, observed by others, which became still greater; as also in this case a tough strand in connection with the pupillary membrane was traceable from the lateral pupillary margin into the adjoining sinus. Thus it seemed probable that the extension of the iris in the surface at two opposite places was prevented by the traction of abnormal strands, and the slit shaped pupil resulted.

The lateral glassy ridge at the sinus of the left eye supported this view as it might have been regarded as the only remnant of such abnormal strand formation. But as it occurred only on one side it caused only a corectopia in the direction of the strand without slit form. The transillumination in this case showed definitely that it depends in the first place on the pigment content of the pigment layer of the iris, while the stroma plays only a subordinate or no part.

C. Z.

**Pillat, A. Parenteral Injections of Milk in Gonoblennorrhea.** Zeit. f. Augenh. 1921, v. 45, p. 269.

In order to gain an objective judgment on the value of exclusive treatment by parenteral milk injections, of gonoblennorrhea of the human eye, Pillat tested the gonococcus contents of the epithelium every 6 hours. There was no other treatment, excepting irrigations with weak solutions of permanganat of potash or physiologic salt solutions for removal of pus, and atropin.

The results in 19 cases are given in tabular form. After the first 2 injections the gonococci generally disappear entirely from the ocular conjunctiva, on

the 3d or 4th day, with subsidence of chemosis and redness. On the palpebral conjunctiva and retrotarsal folds, the number of gonococci is very much reduced, but one seems only rarely to succeed in wholly removing the gonococci. They seem to continue to live, and only by a third and fourth injection can they be removed entirely. If 4 injections have not been successful, further injections mostly are without avail. The milk injections do not prevent an infection of the second eye, which shows that they have no permanent effect, and do not produce any immunity, even of local nature.

The author emphasizes that he does not in the least urge an exclusive milk treatment, but, since it has been proven that milk alone is able to cure gonoblennorrhea of the eye, the additional application of milk injections in the treatment of gonoblennorrhea are not only justified, but required in all those cases, in which general chechexia and severe constitutional anomalies, or progressive ulcers of the cornea, do not furnish a contraindication. There is no better or more rapid means of removing the tense swelling of the lids than milk injection; so that they prepare the soil for the classical treatment with nitrat of silver. Finally the author presents his views on the action of parenterally introduced proteins.

C. Z.

**Heine, L. Endogenous Uveitis.** Graefe's Arch. f. Ophthal, 105 Band, Festschrift f. E. Fuchs.

In the lengthy paper, Heine refers to E. Fuchs' contribution on chronic endogenous uveitis. Heine prefers to call the affection endophthalmitis, because in some cases the uvea and retina are primarily acutely affected. A minute description of the objective and subjective symptoms and the disturbances of function are enumerated, and the casual factors entered into; coming to the conclusion that uveitis or endophthalmitis, especially the chronic form, is not caused by intoxication or by postinfectious intoxication, but thru a genuine infection.

H. A.

**Kümmell, R. Genesis of Detachment of the Retina.** *Klin. M. f. Augenh.* 1921, v. 67, p. 150.

According to Kümmell, a number of contradictions render the explanation by Leber of the genesis of detachment of the retina doubtful. Since the employment of the tonometer, almost all cases of detachment, even very recent ones, show hypotension, while Leber and Schweigger emphasized the normal tension at the beginning. The occurrence of ruptures is, according to Kümmell, not regular or frequent. He calls attention to the difference of the postretinal fluid from the vitreous, by its high content of albumin and its greater specific gravity which makes it sink downward. This would not take place if it were the same as the pre-retinal fluid.

Kümmell sees the explanation in the changes of the whole uvea, infiltrations and degenerations. As vitreous and lens are in their nutrition dependent upon the uvea, the production of fluid for the vitreous will suffer and a decrease of tension in the vitreous space will follow, with certain degenerations of the vitreous. As the vitreous is intimately connected with the anterior portion of the retina, this will follow its retraction. As the pressure in the choroidal vessels is greater than the intraocular tension, a transudation from these will occur, loosening the connection between retina and choroid. Thus detachment occurs by traction from within and pressure from without.

That the pressure behind the retina is greater is shown by the inward turns of the edges of the retinal ruptures. This pressure may be increased by stooping and physical exertion, which explains the occurrence of detachment after them, in eyes with the existing predisposition. The complications of detachment of the retina are only a further development of the original affection of the uvea, as iridocyclitis, cataract.

The impossibility of the genesis of detachment by preretinal strands is proven by the occurrence of reattachment, as always in the upper portion, which the retraction of the strands

would necessarily prevent. Hence the therapeutic cutting of such strands is uncertain and of no avail. The treatment must aim to withdraw the subretinal fluid and increase the intraocular pressure, as devised by Birch-Hirschfeld.

C. Z.

**Doyne, P. G. Scotomata of Tobacco Amblyopia.** *Brit. Jour. Ophth.* 1922, v. 6, p. 1.

Doyne observes that, since small changes in the acuity of the central retinal zone form so important a factor in the early diagnosis of glaucoma, it is important that more exact knowledge of the various scotomata associated with the different diseases affecting the central retinal zone should be determined.

In studies of tobacco amblyopia, the author places most importance upon the results obtained by the use of a white test object. When using colored test objects, difficulty is met in trying to make the patient adopt a standard saturation. Red is easier to work with than green. Green test objects proved unsatisfactory. While he uses Bishop Harman's scotometer, he feels that Bjerrum's Screen is the method of real accuracy. A 2 mm. test object is used, but for colors a 4 mm. object is used, outside the 10 degree circle. In tobacco amblyopia there appear to be three types of scotomata.

(1) A large scotoma involving the blind spot and the area between the blind spot and fixation, which stops just short of the actual fixation point. (2) A scotoma lying close to fixation, within the 5 degree circle, connected by a relative area to the blind spot, which may or may not be prolonged toward fixation. (3) A scotomatous finger pointing from the blind spot towards fixation.

These three forms demonstrate different degrees of severity. Three typical illustrative case histories and eleven charts accompany the contribution. In early glaucoma, the earliest scotomata are found along the ten and fifteen degree circles, or from the upper and lower borders of the blind

spot. In tobacco amblyopia, it is the area between the blind spot and fixation which is first involved. Finally, the author in later cases takes the after images for red, green and blue. Tobacco patients will see a yellow after image of the blue card; but, except in mild cases, will not appreciate the after image of the red or green. They state after red its site looks rather brighter, and after green rather darker than the surrounding area. D. F. H.

**Holth, S. Subconjunctival Fistula Scars After Iridencleisis or Limbal Sclerectomies in Chronic Glaucoma.** Brit. Jour. Ophth. 1922, v. 6, p. 10.

Holth states that, while we have learned that in glaucomatous eyes which are enucleated as the result of late infection, the infiltration has effaced the usual conditions present in the scar after successful operations, it is more important to study the anatomic conditions of the scars of the successful operations without any later complications. With this object in view he has since 1905 enucleated glaucomatous eyes which have been subjected to successful iridencleisis or sclerectomies. In substantiation of his statement in 1913, that a real fistula thru the limbal sclera is seen several years after successful operations, he reports the microscopic findings with seven illustrations of five cases examined from five months to six years after successful operations. Under each illustration is a very full description. All specimens showed a soft conjunctival cushion near the limbus, some with a thin glassy bubble and some without. The fistulous tracts were lined with pigment epithelium, some ending in a cyst, others in funnel shaped spaces more or less lined with pigment epithelium.

Two of his illustrations will explain the phenomenon discovered by Seidel of the oozing out of the aqueous thru the thin conjunctival bubble. The author believes that this oozing must be due to the denser connective tissue surrounding the bubble forming an obstacle to the subconjunctival passage of the aqueous. While a normal tension is thus obtained, it is undesirable as it

affords an easy way to late infection. Therefore, subconjunctival cicatricial tissue should be avoided. In performing different subconjunctival operations, the palpebral fissure should be well opened vertically, thus affording plenty of space for the formation of the conjunctival flap of the subconjunctival tunnel.

D. F. H.

**Hepburn, M. L. Experiences From Trephine Operations for Glaucoma.** British Jour. of Ophth. v. 6, No. 3, 1922, p. 97.

The author's contribution contains observations of great merit, and should command the attention of all interested in this question. In all perforating wounds of the eye, it is the aim of the surgeon to avoid permanent inclusion of the iris, owing to the danger which we have always been taught. If this is true, the author fails to follow the argument by which it is sought to justify iris inclusion and silk inclusion in trephine operations. While it is a dangerous practice to leave an opening in the eye only separated from the external air by a relatively thin layer of conjunctiva, this applies to all filtering scars, however they are made, and the only question to decide is which is the least dangerous.

In a subject like glaucoma we cannot be too careful in collecting all the available evidence, in order to enable us to decide on the best type of operation. Hepburn's observations are based upon 140 trephine operations, 29 of which were private patients. Along with his successes he has not escaped the complications which others have experienced, such as delayed reformation of the anterior chamber, loss of the disc, loss of vitreous. Late infection is extremely rare at Moorfield's.

The technic the author has learned to adopt is; to dissect an efficient conjunctival flap in its entire thickness down to the sclera, being careful not to buttonhole. Pulling the flap down the cornea, with a secondary cataract knife the superficial layers of the cornea are stripped up. The trephine is slid along the sclera until it comes in contact with the flap. The flap is



drawn upward and backward so as to avoid buttonholing. The anterior part of the scleral disc is cut thru before the posterior, thus forming a hinge posteriorly. The trephine is never removed until the section is complete. Penetration is indicated when the pupil comes towards the hole. The iris is grasped with straight forceps pulling downward and forward detaching it from its root. The disc is then cut off and the conjunctival flap sutured.

Regarding complications, buttonholing the flap should be avoided; if it occurs a new place must be selected. Loss of the disc happened three or four times; upon one occasion it was not recovered, but made no difference in the prognosis. In complete iridectomy, if intentional, the iris must be pulled well out; a buttonhole iridectomy is unwise. A complete iridectomy by mistake happened three or four times. The author feels that in these cases the root of the iris was probably left behind.

Vitreous loss may not influence drainage; no doubt it depends upon whether it is solid or liquid. This occurred three or four times in the series. Delay in reformation of the anterior chamber occurred in about half a dozen cases. This may be due to drainage beneath the conjunctival flap. If formation is delayed too long, there is danger of iris adhesion. The lens comes forward and sometimes becomes opaque. This occurred two or three times. Usually it is difficult to determine if the opacity existed before operation. Detachment of the choroid did not happen very often, altho it may occur without being recognized. It generally becomes replaced.

Late infection. Inflammations within a few weeks may be ascribed to direct infection. Those taking place many years afterwards in the presence of a thick, firmly attached flap with good drainage, the author does not place under this heading.

Results; cases secured early and operated when tension was normal gave the best results. For acute glaucoma, in which tension cannot be reduced, iridectomy is performed. The series

records about thirteen failures, all in those where the tension was raised. In acute and secondary glaucoma the results were not good; there is too much congestion around the limbus.

D. F. H.

**Holth, S. Sclerectomy in Chronic Glaucoma.** Norsk Magazin for Laegevidenskaben, vol. 82 p. 645.

A flap of the conjunctiva is made like that used as preliminary for the Elliot trephining. A lance knife is used in making an incision 3 or 4 mm. long, about 1.5 to 2 mm. back of the limbus. One blade of a specially constructed forceps is inserted into the anterior chamber back of the posterior lip of the incision, and a strip of the sclera, 1 mm. wide and up to 3 mm. long, parallel with the corneal margin, is punched out. The conjunctival flap is then replaced and stitched. The effect in substance is that of a trephining with an elongated scleral opening. The main advantages claimed by the author are that the scleral defect can be secured without using any pressure on the eyeball, and that it (the defect) becomes located as far as possible from the cornea, where the conjunctiva is thick, thereby giving much better protection against late infections.

D. L. T.

**Bachstetz, E. Acid-fat Lime as Basis of Scintillating Vitreous Bodies.** Wiener med. Wochenschr., 1921, p. 1044.

Bachstetz for several years has observed a picture of scintillating bodies in the vitreous which showed no lustre or refractive surfaces. The opacities appeared as small spherical bodies of a dull white color, which hardly moved when the eyeball was rotated showing the vitreous to be nonliquified. He had occasion to examine two eyes chemically and found that the small bodies were soluble in hydrochloric acid-ether-alcohol, the usual solvent for fatty lime. Treatment with Sudan gave a delicate reddish color, with Nile blue an intense blue. Incineration verified the test.

H. A.

**Bergmeister, R. Rare Epibulbar Tuberculosis.** *Wiener med. Woch.*, 1921, No. 24, p. 1045.

A clinical and histologic description is given of a case of tuberculosis of the conjunctiva and of the cornea. The cornea was affected partly by continuity from the epithelial process and partly by interruption, probably by the passage of bacilli thru the lymph stream from the subconjunctival focus to the cornea. It was remarkable, that from the subconjunctival and episcleral tuberculous foci, the process entered the interior of the bulbus thru the anterior scleral passages, indeed, contrary to the lymph stream, which generally leads from within outward. The sclera was partly necrosed; thereby the necrotic scleral portion was not in contact with the tubercles contained in the conjunctiva and subconjunctiva, but they were respectively separated near the anterior passage from the episclera by lymphoid tissue. Only the small cellular layer between the sequestrum and the almost normal ciliary muscle had a partly epithelioid and fibroplastic character.

H. A.

**Ferrari, G. Lesions of Fundus Oculi in Lethargic Encephalitis.** *Arch. di. Ottal.* v. 27, 1920, pp. 228-243.

The early writers who describe lethargic encephalitis deny the occurrence of fundus lesions in it. Observers of the recent epidemic, however, have begun to notice them. These observations are reviewed, the author reporting nine cases of his own, with careful description of the fundus findings. He divides the lesions found into two classes:

(1) Those depending apparently upon diseases of the optic nerve itself. Five cases were found to fall into this class and showed hyperemia of the disc, blurring of the disc margins, and frank optic neuritis, occasionally slight turbidity of the retina about the disc. Lesions in the retina were never observed. Later some cases showed a pallor of the disc and slight constriction of the arteries. The functional disturbances in this class were usually greatly out of proportion to the oph-

thalmoscopic findings. Vision was reduced in some cases to 1/10 in both eyes, more usually 1/2 to 1/3, with concentric constriction of fields, dyschromatopsia and occasional central scotoma. Some cases showed no changes in the nerve when vision was reduced very considerably. These were considered cases of retrobulbar neuritis. The author considers that all his cases of this group represent a true peripheral or retrobulbar optic neuritis due to localization of bacteria or toxins in the optic nerves.

(2) This group includes congestive lesions depending on disease elsewhere in the body, and especially on a rise of cerebrospinal pressure. Cases were characterized by choked disc with marked venous stasis. This occurred in three severe cases, all showing increase in cerebrospinal pressure. From autopsy on one of these cases, the author believes that all of them may depend on hydrocephalus caused by stopping of the outlets to the ventricles. The prognosis in both types is usually good if the patient does not succumb to his general condition. Only a few showed an amblyopia persisting for some time after recovery.

S. R. G.

**Friede, R. Hydroa Vacciniforme of the Eye.** *Klin. M. f. Augenh.* 1921, v. 67, p. 26.

Friede reports in detail the clinical history of a man, aged 48, in whom hydroa vacciniforme of the parts of the skin exposed to the light of the sun during the summer months, commenced in early childhood, affecting hands, face, and especially the nose and ears. Not until his 35th year did the eyes become involved, in intimate connection with the skin disease. The primary direct lesions of the eyes were papulous efflorescences on the lids, infiltrations and ulcers of the cornea and necrosis of the sclera.

Suddenly under intense photophobia and lacrimation, a severe diffuse inflammation of the ocular conjunctiva set in with ciliary injection and succulent chemosis. Soon flat, illdefined, congested subconjunctival nodules arose on places exposed to the sunlight. These assumed a bluish red and finally

a yellowish discoloration, indicating necrosis of the sclera. The thinned conjunctiva perforated, so that the necrotic masses were laid bare. After gradual sloughing, deeply punched out holes of the sclera were formed, their base covered with thin cicatricial tissue; so that a slate grey, not bulging, spot of the sclera remained. On the left eye a flat staphyloma developed in the temporal portion, within the palpebral fissure. The corneas showed maculae and there were remnants of a former iritis.

Secondary changes were: exophthalmus from orbital cellulitis, caused by the scleral necrosis and the subsequent inflammatory infiltration in and around Tenon's capsule; atrophy of the optic

nerve from the same cause, and symptoms of cicatricial shrinking of the lids. During the regressive period there was intense hematuria. This was of interest, as hydroa vacciniforme is caused by light in consequence of photodynamic sensibilization thru hematuria.

For prophylaxis, patients suffering from hydroa vacciniforme of the skin ought to wear well fitting coquilles, especially in spring, as then the sunlight is especially rich in ultraviolet rays. For the lids, curcuma tincture, unguent. ichthyol, and zeozon are recommended. An eye affection is most successfully treated by complete exclusion of light.

C. Z.

## NEWS ITEMS

Personals and items of interest should be sent to Dr. Melville Black, 424 Metropolitan Building, Denver, Colorado. They should be sent in by the 25th of the month. The following gentlemen have consented to supply the news from their respective sections: Dr. Edmond E. Blaauw, Buffalo; Dr. H. Alexander Brown, San Francisco; Dr. V. A. Chapman, Milwaukee; Dr. Robert Fagin, Memphis; Dr. M. Feingold, New Orleans; Dr. Wm. F. Hardy, St. Louis; Dr. Geo. F. Keiper, LaFayette, Indiana; Dr. Geo. H. Kress, Los Angeles; Dr. W. H. Lowell, Boston; Dr. Pacheco Luna, Guatemala City, Central America; Dr. Wm. R. Murray, Minneapolis; Dr. G. Oram Ring, Philadelphia; Dr. Chas. P. Small, Chicago; Dr. John E. Virden, New York City; Dr. John O. McReynolds, Dallas, Texas; Dr. Edward F. Parker, Charleston, S. C.; Dr. Joseph C. McCool, Portland, Oregon; Dr. Richard C. Smith, Superior, Wis.; Dr. J. W. Kimberlin, Kansas City, Mo.; Dr. G. McD. Van Poole, Honolulu; Dr. E. B. Cayce, Nashville Tenn.; Dr. Gaylord C. Hall, Louisville, Ky. Volunteers are needed in other localities.

### DEATHS.

Dr. P. Bajardi, Professor of Ophthalmology at Turin, Italy, died in December, 1921.

Dr. Thomas E. Conard, Philadelphia, aged seventy-five, died suddenly, February 12th, from heart disease.

Dr. Theron James Kinnear, Springfield, Illinois, aged forty-five, died February 28th, following an operation for a furuncle.

Dr. S. A. Pennington, Port Arthur, Texas, aged forty-five, died February 16th, following an operation for appendicitis.

Dr. Dubois de la Vigerie, ex-Chef de Clinique of the Clinique Nationale des Quinze-Vingts, General Secretary of the Société Française d'Ophthalmologie, Chevalier of the Legion of Honor, is dead at the age of seventy years.

### PERSONALS.

Mr. Sydney Stephenson has been elected an honorary member of the Midland Ophthalmological Society.

Dr. Casey A. Wood, of Chicago, is returning home from British Guiana by way of England to attend the International Congress.

Dr. and Mrs. Melville Black will be in England during June and July, on an automobile tour with some friends.

Mr. Cyril Jacobs has been appointed honorary ophthalmic surgeon to the Victoria Memorial Jewish Hospital, at Manchester, and oculist to the Cheshire Educational Committee.

Dr. Allen J. McLaughlin, U. S. Public Health Service, Washington, has been elected a member of the Board of Councillors of the Eyesight Conservation Council of New York City.

Drs. William E. Gamble, Ephraim K. Findlay, and Richard C. Gamble, announce the formation of partnership for the practice of Ophthalmology and Oto-Laryngology, with offices at 30 North Michigan Avenue, Chicago.

A dinner was given to Dr. George Edmund de Schweinitz, President-elect of the American Medical Association, by the Philadelphia County Medical Society, on Tuesday evening, April 4th, at the Bellevue-Stratford Hotel. About 500 physicians were in attendance.

At the March meeting of the St. Louis Ophthalmic Society, Professor Ernst Fuchs, Vienna, addressed the Society on "The Progress of Ophthalmic Therapeutics from 1870 to the Present Time." At the close of the meeting, Professor Fuchs was elected an honorary member of the Society.

Dr. Russell W. Raynor, U. S. Public Health Service, has been assigned for duty with the Illinois State Department of Health, to make a survey in the southern sections of the state for trachoma. Dr. Raynor has been in charge of the government trachoma hospital in Pikeville, Kentucky.

In the world of ophthalmology, few names are better known than that of John Herbert Parsons. He is one of the founders of the Council of British Ophthalmologists, and a member of numerous Government committees on matters pertaining to the eyes. His well known "Pathology of the Eye" is alone in its class, and his treatise on Color Vision is the most scientific work on the subject in the English language. He has been made a Fellow of the Royal Society, and the recent honor of Knighthood conferred on him is one which will gratify everyone who knows him.

## SOCIETIES.

A new Société de Neuro-Oto-Oculistique has been created at Strasbourg with M. Barré, President and M. Duverger, Vice-President.

The Annual Congress of the Ophthalmological Society of the United Kingdom will be held May 11th to 13th in London, when the Edward Nettleship prize will be awarded.

The Charity Eye, Ear and Throat Hospital of Erie County, Buffalo, New York, has recently issued its thirteenth annual report. It has done some good work in this section of the country and the report makes interesting reading.

At the joint meeting of the Chicago Ophthalmological Society and The Institute of Medicine, April 21, Professor E. Fuchs was the guest of honor. A dinner preceded.

At the January meeting of the St. Louis Ophthalmic Society the following officers were elected for the ensuing year: Dr. F. E. Woodruff, president; Dr. W. A. Shoemaker, vice-president; Dr. John Flury, secretary; Dr. Jos. W. Charles, editor.

At the recent annual meeting of the Puget Sound Academy of Ophthalmology and Otolaryngology the following were elected officers for the ensuing year: Dr. Frederick W. Adams, Seattle, president; Dr. Daniel Hughes Bell, Tacoma, first vice-president; Dr. William G. Cameron, Tacoma, second vice-president; and Dr. John Howard Harter, Seattle, secretary-treasurer.

The Section of Ophthalmology of the New York Academy of Medicine gave a very interesting program on the evening of March 20th. The subject was a symposium on the value of the Wassermann test, and was participated in by Dr. Charles G. Darlington,

Dr. John D. Fordyce, Dr. Warren Coleman, Dr. Robert E. Pou, Dr. Ellice M. Alger, and Dr. Herbert W. Wootton.

The Baltimore Medical Society and The Section on Ophthalmology held a joint meeting on Wednesday, March 29th. Hofrath Ernst Fuchs presented a paper on "Ocular Manifestations of Internal Secretion." Dr. George E. de Schweinitz opened the ophthalmologic and Dr. Lewellys F. Barker the medical discussions.

## MISCELLANEOUS.

The new building of the Harlem Eye and Ear Hospital, New York, was formally opened March 14th.

The A. Bernard Building, Russellville, Arkansas, is being converted into a government hospital for the treatment of trachoma.

A college for the higher education of blind girls has recently been opened in England, in a beautiful suburb about twenty miles from London. The education will be as liberal as in the best public schools for girls, and the physical and mental development afforded will enable blind girls to live full and active lives at home, at school, and in the professions. The fees are moderate, and there are several scholarships for girls of promise.

The following appointments of ophthalmologists to the various hospitals of Paris are noted for the year 1922-1923.

Hôpital de la Pitié  
Consultant in Ophthalmology.....Monthus  
Alternate (suppleant) .....Drécourt  
Externes.....E. Verger, Miss Thizy

Hôpital Saint-Antoine  
Consultant in Ophthalmology.....Dupuy-Dutemps  
Alternate .....Joseph  
Externes.....Menard, Marguet

Hôpital Cochin  
Consultant in Ophthalmology.....Cantonnet  
Alternate .....Fombeure  
Externes.....Leseuer-Lerebour, Miss Joltrois

Hôpital Lariboisière  
Ophthalmologist .....Morax  
Assistant .....Bollack  
Internes.....Dujarier, Lagrange  
Externes.....  
....Hudelo, Autier, Isnel, Fenal, Depouilly

Hôpital Laennec  
Ophthalmologist .....Rochon-Duvigneaud  
Interne .....Valière-Vialeix  
Externes.....Allaire, Talot dit Margival, Paumelle

Hôtel-Dieu  
Surgeon.....Prof. de Lapersonne  
Assistant.....  
Chief of Clinic.....Velter  
Adjunct Chiefs of Clinic.....Cousin, Gautrand  
Chefs de Labor.....Monbrun, Hautant  
Internes.....Castéran, Miss Ostwalt  
Externes.....Parat, Gély, Bertrand,  
Chéreau, Chaupis, Corneau, Mrs. Parat

Hôpital des Enfants-Malades  
Ophthalmologist .....Poulard  
Assistant .....Boussi  
Interne .....Veil  
Externe..Cayla, Restoux, Barillot, Miss Lacroix



## Current Literature

These are the titles of papers bearing on ophthalmology received in the past month. Later most of them will be noticed in *Ophthalmic Literature*. They are given in English, some modified to indicate more clearly their subjects. They are grouped under appropriate heads, and in each group arranged alphabetically usually by the author's name in **heavy-face type**. The abbreviations mean: (Ill.) illustrations; (Pl.) plates; (Col. Pl.) colored plates. Abst. shows it is an abstract of the original article. (Bibl.) means bibliography and (Dis.) discussion published with a paper. Under repeated titles are given additional references to papers already noticed. To secure early mention, copies of papers or reprints should be sent to 318 Majestic Building, Denver, Colorado.

### DIAGNOSIS.

- Ammann, E. Testing of foveal vision in the glaucomatous and of amblyopes. (1 ill.) *Klin. M. f. Augenh.*, 1922, v. 67, p. 564.
- Amsler, M. General and local tonometric ocular reaction. (2 ill.) *Rev. Gén. d'Opht.*, 1921, v. 35, pp. 477-483.
- Cohen, M. Mercury tonometer. (6 ill.) *Rev. Cubana de Oft.*, 1921, v. 3, pp. 720-725.
- Costello, J. P. Importance of ophthalmoscopic examination in children. *Jour. Missouri State Med. Assn.*, 1922, v. 19, pp. 118-120.
- Dameno, E. Hand phorometer. (1 ill.) *La Prensa Med. Argentina*, 1921, v. 8, p. 343.
- French, J. W. Interocular distance. *Arch. of Optometry*, 1922, v. 1, pp. 51-55.
- Schnyder, W. F. Simple arc slit lamp and new principle of illumination. (7 ill.) *Zeit. f. Augenh.*, 1922, v. 26, pp. 328-345.
- Sulzer, G. A. Chart for testing vision of literate and illiterate. (Chart). *A. J. O.*, 1922, v. 5, p. 208.
- Tallman, M. H. Test chart usable with or without mirror. (1 ill.) *Arch. of Optometry*, 1922, v. 1, pp. 26-28.

### THERAPEUTICS.

- Ascher, K. W. Quartz and Kromayer lamp in treatment with ultraviolet light. (2 ill.) *Klin. M. f. Augenh.*, 1922, v. 67, p. 662.
- Avalos, E. Indications and contraindications for salvarsan and neosalvarsan in ocular therapeutics. *Rev. Cubana de Oft.*, 1921, v. 3, pp. 695-703.
- Chenet, L. Protein therapy in ophthalmology. *Médecine*, 1922, v. 3, p. 269. Abst. *J. A. M. A.*, 1922, v. 78, p. 849.
- Erdoes, E. Subconjunctival salt injections. *Zeit. f. Augenh.*, 1922, v. 46, p. 358.
- Fox, L. W. Hydrostatic ocular irrigator. (1 ill.) *Rev. Cubana de Oft.*, 1921, v. 3, p. 729.
- Jendralski, F. Radiotherapy for tumors and tuberculosis of eye. *Klin. f. Augenh.*, 1922, v. 67, pp. 629-634.
- Monthus, A. Thermal mineral waters in ophthalmology. *Médecine*, 1922, v. 3, p. 270.
- Simon de Guilleuma, J. M. Theory of ions in ophthalmology. (2 ill.) *Rev. Cubana de Oft.*, 1921, v. 3, pp. 666-671.
- Terrien, F. Subconjunctival injections. *Médecine*, 1922, v. 3, p. 251. Abst. *J. A. M. A.*, 1922, v. 78, p. 848.
- Toulant. Salves in ophthalmology. *Médecine*, 1922, v. 3, p. 278. Abst. *J. A. M. A.*, 1922, v. 78, p. 849.

Vacher, L., and Denis, M. Galvanocautery in ophthalmology. *Médecine*, 1922, v. 3, p. 272.

Repeated titles. Stumpf. (*A. J. O.*, 1922, v. 5, p. 162.) *International Medical and Surgical Survey*, 1922, Feb., p. 88.

### OPERATIONS.

- Fertig, A. New pressure bandage. *Zeit. f. Augenh.*, 1922, v. 47, p. 100.
- Grosz, E. v. Transfixion of iris after Fuchs. *Zeit. f. Augenh.*, 1922, v. 46, p. 357.
- Merz-Weigandt. Hair sutures. *Klin. M. f. Augenh.*, 1922, v. 67, p. 649.
- Ramsay, A. M. Operating hand lamp. (1 ill.) *Arch. of Ophth.*, 1922, v. 51, p. 152.

### PHYSIOLOGIC OPTICS.

- Boegehold, H. History of lens cardinal points. *Zeit. f. ophth. Opt.*, 1921, v. 9, pp. 161-170.
- Guist, G. Perception of space and space pictures. (10 ill.) *Zeit. f. Augenh.*, 1922, v. 47, pp. 31-41.
- Mueller, E. Monocular and binocular stimuli of dark adapted eye. *Pfueger's Arch. f. d. g. Phys.*, 1921, v. 193, p. 29.
- Oehrwall, A. Analysis of sense impressions. *Skand. Arch. f. Phys.*, 1921, v. 41, pp. 227-294.
- Palacios, F. Physiologic theory of vision. *Pediat. España*, 1921, v. 10, p. 305.
- Strebel, J. Photometric measurements of fatigue. *Schweiz. med. Woch.*, 1921, v. 51, p. 1138. Abst. *International Medical and Surgical Survey*, 1922, March, p. 168.
- Tscherning, M. Adaptation of eye to light. *Compt. rend. Soc. de Biol.*, 1922, v. 86, p. 223. Abst. *International Medical and Surgical Survey*, 1922, March, p. 162.
- Repeated titles. Passow. (*A. J. O.*, 1922, v. 5, p. 162.) *International Medical and Surgical Survey*, 1922, Feb., p. 88.

### REFRACTION.

- Chambers, T. R. Trifocals minus wafers. (4 ill.) *Arch. of Ophth.*, 1922, v. 51, pp. 154 and 172.
- Graves, A. Refraction as a side line. *Med. World*, 1922, April, p. 136.
- Kuehl, A. Vertex spherometer. *Zent.-Zeit. f. Opt. u. Mech.*, 1921, v. 42, pp. 517-519.
- McFadden, F. Anomalous accommodation. (1 ill.) *Arch. of Optometry*, 1922, v. 1, pp. 18-25.
- Marquez, M. Variety of principles of blattigmatism. *Rev. Cubana de Oft.*, 1921, v. 3, pp. 649-661.

**Mendoza, R.** Influence of convex glass on presbyopia. *Rev. Cubana de Oft.*, 1921, v. 3, p. 728.

Repeated titles. **Bloch.** (A. J. O., 1922, v. 5, p. 80.) *International Medical and Surgical Survey*, 1922, March, p. 164.

#### OCULAR MOVEMENTS.

**Argañaraz, R.** Hereditary syphilis with nystagmus. *Prensa Med. Argentina*, 1921, v. 8, p. 237.

**Asmus.** Operations on ocular muscles. *Zeit. f. Augenh.*, 1922, v. 47, pp. 79-86.

**Blaskovics, L. v.** Muscle contraction. *Zeit. f. Augenh.*, 1922, v. 46, p. 359.

**Borries, G. V. T.** Experimental optic nystagmus. *Trans. Dansk. Oto-Laryng. Selskab*, 1921, p. 31.

Nystagmus in labyrinthitis serosa. *Trans. Dansk. Oto-Laryng. Selskab*, 1921, p. 32.

**Brown, E. J.** One advantage of single vision. *A. J. O.*, 1922, v. 5, pp. 208-210.

**Csapody, S.** Examination for paralysis of ocular muscles. *Budapest Orv. Ujsag.*, 1921, v. 19, p. 657. *Abst. International Medical and Surgical Survey*, 1922, Feb., p. 100.

**Dodge, R.** Latent time of compensatory eye movements. *Jour. Exper. Psychol.*, 1921, v. 4, p. 247. *Abst. International Medical and Surgical Survey*, 1922, March, p. 167. Mirror recorder for photographing compensatory movements of closed eyes. *Jour. Exper. Psychol.*, 1921, v. 4, p. 165. *Abst. International Medical and Surgical Survey*, 1922, Feb., p. 98.

**Fischer, J.** Movements of eyeballs due to ear. *Monat. f. Ohr. u. Lar.-Rhin.*, 1921, v. 55, p. 764-771.

**Fisher, W. B.** Development of low visual acuity and ocular dynamics. *Arch. of Optometry*, 1922, v. 1, pp. 5-13.

**Freeman, W.** Paralysis of associated lateral movements of eye symptom of intrapontile lesion. *Arch. of Neurol. and Psychiat.*, 1922, v. 7, pp. 454-488.

**Friedman, J., and Greenfield, S. D.** Traumatic abducens paralysis. *Laryngoscope*, 1921, v. 38, p. 868.

**Fuog, H. L.** Significance of exophoria at reading points in presbyopia. *Arch. of Optometry*, 1922, v. 1, pp. 29-34.

**Hotelling, E. E.** Treatment of amblyopia in one eye. *Arch. of Optometry*, 1922, v. 1, pp. 38-41.

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**Landolt, M.** Target practice with Hering's double eye. (9 ill.) *A. J. O.*, 1922, v. 5, pp. 189-195.

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**Mulder, M. E.** Orientation illusions in moving train. *Nederl. Tijdschr. v. Geneesk.*, 1921, v. 2, p. 2785. *Abst. J. A. M. A.*, 1922, v. 78, p. 932.

**O'Connor, R.** Transplantation of entire vertical recti for abducens palsy. *A. J. O.*, 1922, v. 5, p. 210.

**Rose.** Left protuberant lobe syndrome with homolateral partial excitation of sympathetic. *Soc. de Neur.*, Feb., 1922. *Abst. Gaz. des Hôp.*, 1922, v. 95, p. 221.

**Rosett, J.** Nystagmus in lesion of abducens nucleus. *Neurol. Bull.*, 1921, v. 3, pp. 332-338.

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**Wiseman, E. G.** Object of ocular calisthenics. *Arch. of Optometry*, 1922, v. 1, pp. 14-17.

**Woolsey, C. L.** Influence of vision on nystagmus. *Arch. of Neurol. and Psychiat.*, 1922, v. 7, p. 526.

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**Ascher.** Keratoplasty. *Klin. M. f. Augenh.*, 1922, v. 67, p. 649.

**Bane, W. C., and W. M.** Ocular pemphigus. (1 ill.) *A. J. O.*, 1922, v. 5, p. 221.

**Bohnslav, S.** Amyloid and hyalin degeneration of conjunctiva. *Casp. Lek. Cesk.*, 1921, v. 60, p. 841. *International Medical and Surgical Survey*, 1922, March, p. 172.

**Brand, J.** Treatment of trachoma. *Zeit. f. Augenh.*, 1922, v. 47, p. 165.

**Cuperus, N. J.** Rodent ulcer of conjunctiva. *Klin. M. f. Augenh.*, 1922, v. 67, p. 652.

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**Feigenbaum, A.** Tarsectomy for trachoma and trichiasis. *Klin. M. f. Augenh.*, 1922, v. 67, pp. 600-606.

**Hammerschmidt, J.** Causative agent of Koch-Weeks conjunctivitis. *Münch. med. Woch.*, 1921, v. 68, p. 1246. *Abst. International Medical and Surgical Survey*, 1922, p. 31.

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**Kritzler, H.** Diphtheria and diphtheroid bacilli in newborn and their clinical significance. *Zeit. f. Geburts. u. Gyn.*, 1921, v. 84, pp. 179-207.

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- Thim, J. R. Prowazek's bodies. 1922, J. Safar, Vienna and Leipzig.
- Von Der Heydt, R. Keratosis at limbus. *A. J. O.*, 1922, v. 5, p. 228.
- Ulises de la Garza, J. Prophylaxis of purulent ophthalmia. *Rev. Cubana de Oft.*, 1921, v. 3, pp. 688-695.
- Repeated titles. Gernet. (*A. J. O.*, 1922, v. 5, p. 163.) International Medical and Surgical Survey, 1922, Feb., p. 104. Winsky. (*A. J. O.*, 1922, v. 5, p. 163.) Abst. International Medical and Surgical Survey, March, 1922, p. 174.
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- Arana, J. de. Treatment of serpiginous ulcer of cornea. *Rev. Cubana de Oft.*, 1921, v. 3, pp. 671-677.
- Cabannes, C., and Chavannaz, J. Subcutaneous injections of novarsenobenzol in hereditary syphilitic interstitial keratitis. *Jour. de Méd. de Bordeaux*, 1922, v. 94, p. 10. Abst. International Medical and Surgical Survey, 1922, March, p. 178.
- Fietta, P. Treatment of corneal affections with iontophoresis. *Rev. Gén. d'Ophth.*, 1922, v. 36, p. 10.
- Fleisher, M. S. Heterotransplantation of lens and cornea. *Jour. Med. Research*, 1921, v. 42, pp. 491-503.
- Frey, M. v. Sensibility of cornea and conjunctiva in human eye. *Münch. med. Woch.*, 1921, p. 1572. Abst. *Rev. Gén. d'Ophth.*, 1922, v. 35, p. 541.
- Frey, M. v., and Webels, W. V. Sensibility of cornea and conjunctiva. *Zeit. f. Biol.*, 1922, v. 74, pp. 173-191.
- Grueninger, W. Pigment epithelium of cornea. (24 ill. bibl.) *Zeit. f. Augenh.*, 1922, v. 46, pp. 317-328. Abst. International Medical and Surgical Survey, March, 1922, p. 176.
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- Torres Estrada, A. Neuroparalytic keratitis following rabies in hereditary syphilis. *Rev. Cubana de Oft.*, 1921, v. 3, pp. 704-709.
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- Braná, J. Tubercular iridocyclitis with keratitis punctata profunda. *Zeit. f. Augenh.*, 1922, v. 46, p. 356.
- Escher. Three cases of syphilis in same family, complicated by early secondary iritis. *Ann. de Dermat. et de Syph.*, 1921, v. 2, p. 454. Abst. International Medical and Surgical Survey, 1922, Feb., p. 123.
- Hessberg. Ray treatment of phthisis bulbi. *Zeit. f. Augenh.*, 1922, v. 47, p. 168.
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- Ezell, H. C.** Bulging of filtration bleb following iridotomy. (dis.) *A. J. O.*, 1922, v. 5, p. 224.
- Gifford, H.** Later effects of peripheral iridotomy. *A. J. O.*, 1922, v. 5, p. 242.
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- Malignant glaucoma.** *Zeit. f. Augenh.*, 1922, v. 47, p. 170.
- Hubbard, S. T.** Glaucoma operations. *Jour. Tenn. State Med. Assn.*, 1922, v. 14, pp. 414-422.
- Knapp, A.** Late infection after trephining. *Arch. of Ophth.*, 1922, v. 51, p. 177.
- Schoenberg, M. J.** Koller's paper on physiologic mode of action of mydriatics and miotics on hypertension (glaucoma). *Arch. of Ophth.*, 1922, v. 51, pp. 156-162.
- Schwarzkopf, G.** Pathologic and anatomic study of glaucoma and aqueous humor. (3 ill. bibl.) *Zeit. f. Augenh.*, 1922, v. 47, pp. 87-100.
- Spencer, F. R., and LaRue, C. L.** Glaucoma. (dis.) *A. J. O.*, 1922, v. 5, p. 222.
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- Brose, L. D.** Congenital anterior capsular cataract. (bibl.) *A. J. O.*, 1922, v. 5, pp. 202-205.
- Castresano.** Nucleus of lens dislocated to floor of anterior chamber. *Rev. Ibero-Amer. de Cienc. Med.*, v. 46, pp. 112-118.
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- Hijkata, Y.** Cleavage products of crystalline lens. *Jour. Biol. Chemistry*, 1922, v. 51, pp. 155-165.
- Jackson, E.** Success in cataract extraction. *A. J. O.*, 1922, v. 5, pp. 234-235.
- Jess, A.** Copper in eye. (2 ill.) *Deut. med. Woch.*, 1922, v. 48, pp. 118-120.
- Saint Martin, de.** Total extraction of cataract. *Médecine*, 1922, v. 3, p. 253. *Abst. J. A. M. A.*, 1922, v. 78, p. 848.

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- Blair, C. L.** Macular mass for diagnosis. (dis.) *Royal Soc. Med., Sec. Ophth.*, Dec., 1921. *A. J. O.*, 1922, v. 5, p. 217.
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- Lederer, R.** Angioid retinal streaks. (3 ill.) *Klin. M. f. Augenh.*, 1922, v. 67, pp. 609-619.
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- Vaugiraud, M. de.** Mongolian idiocy. (3 ill.) Arch. de Méd. des Enfants, 1922, v. 25, pp. 158-162.
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